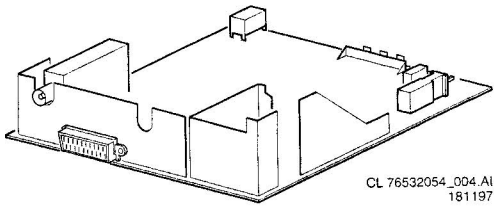


Service  
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A7H.1  
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Service Manual

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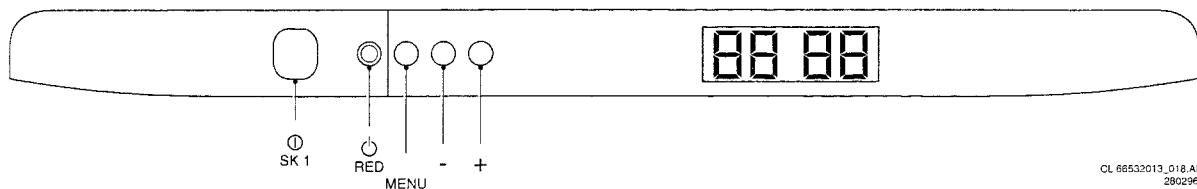
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# 1. Technical specifications

Mains voltage	: 220 - 240 V $\pm$ 10% AC; 50 Hz $\pm$ 5%	Indications	: On Screen Display (OSD) green/red
Power cons. at 220V~	: 14" 43 W (stand-by $\leq$ 6 W) : 17" 45 W (stand-by $\leq$ 6 W) : 21" 63 W (stand-by $\leq$ 6 W)		: 1 LED ( $\odot$ red for stand-by, $\odot$ green for TV-on, blinking red for "RC5" and error code)
Aerial input impedance TV	: 75 $\Omega$ - coax	VCR programs	: 0
Min. aerial input VHF	: 30 $\mu$ V	Tuning and operating system	: $\square$ PLL
Min. aerial input UHF	: 40 $\mu$ V		
Max. aerial input VHF/UHF	: 180mV	UV916E / IEC (PLL)	: VHFa: 48 - 118 MHz : VHFb: 118 - 300 MHz : Hyper: 300 - 470 MHz : UHF: 470 - 861 MHz : UHF: 470 - 861 MHz
Pull-in range colour sync	: $\pm$ 300Hz	U944 / IEC (PLL)	
Pull-in range horizontal sync	: $\pm$ 600Hz		
Pull-in range vertical sync	: $\pm$ 5Hz		
Picture tube range	: 14", 17", 21" : 1 W mono execution: 4" full range round 25 $\Omega$ 2W : 3 W mono execution: 4" woofer round 16 $\Omega$ 3W 1" tweeter round 16 $\Omega$ 3W		
TV Systems	: PAL I : PAL BG : PAL BG / SECAM BGDK : PAL BG / SECAM BGLL'		

## Local operating functions



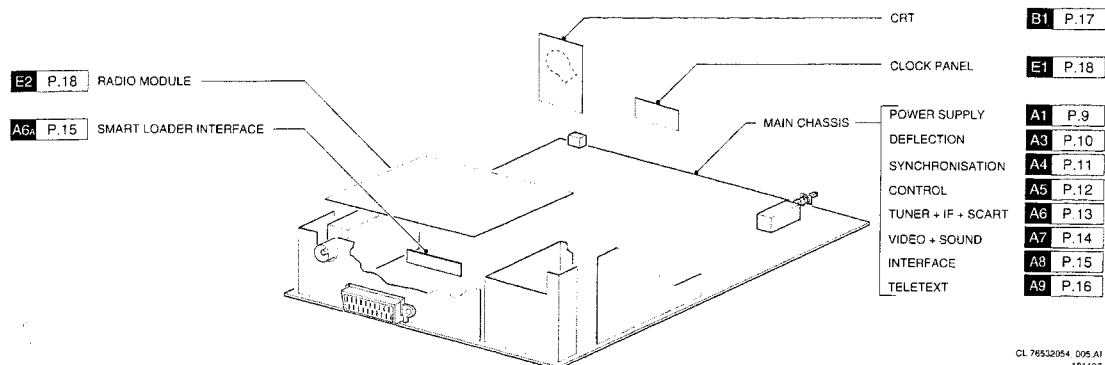
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## 2. Connection facilities

### Euroconnector:

1 - Audio $\odot$ R (0V5 RMS $\leq$ 1k $\Omega$ )	14 - +5SI to smart-loader
2 - Audio $\ominus$ R (0V2 - 2V RMS $\geq$ 10k $\Omega$ )	15 - Red (0V7 <sub>pp</sub> /75 $\Omega$ )
3 - Audio $\odot$ L (0V5 RMS $\leq$ 1k $\Omega$ )	16 - RGB-status (0-0V4 int.)(1-3V ext. 75 $\Omega$ )
4 - Audio $\perp$	17 - CVBS $\perp$
5 - Blue $\perp$	18 - CVBS $\perp$
6 - Audio $\ominus$ L (0V2 - 2V RMS $\geq$ 10k $\Omega$ )	19 - CVBS $\odot$ (1V <sub>pp</sub> /75 $\Omega$ )
7 - Blue (0V7 <sub>pp</sub> /75W)	20 - CVBS $\ominus$ (1V <sub>pp</sub> /75 $\Omega$ )
8 - CVBS-status 1 $\ominus$ (0-2V int., 10-12V ext.)	21 - Earthscreen
9 - Green $\perp$	
10 - SDA to smart-loader	
11 - Green (0V7 <sub>pp</sub> /75 $\Omega$ )	
12 - SCL to smart-loader	
13 - Red $\perp$	

### Location of panels



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### 3. Safety instructions, Maintenance instructions, Warnings and Notes

Chassis A7H.1

3

#### Safety instructions for repairs

1. Safety regulations require that **during** a repair:
  - The set should be connected to the mains via an isolating transformer;
  - Safety components, indicated by the symbol " ", should be replaced by components identical to the original ones;
  - When replacing the CRT, safety goggles must be worn.
2. Safety regulations require that **after** a repair the set must be returned in its original condition. In particular attention should be paid to the following points:
  - As a strict precaution, we advise you to resolder the solder joints through which the horizontal deflection current is flowing, in particular:
    - all pins of the line output transformer (LOT);
    - fly-back capacitor(s);
    - S-correction capacitor(s);
    - line output transistor;
    - pins of the connector with wires to the deflection coil;
    - other components through which the deflection current flows.

#### Note:

This resoldering is advised to prevent bad connections due to metal fatigue in solder joints and is therefore only necessary for television sets older than 2 years.

- The wire trees and EHT cable should be routed correctly and fixed with the mounted cable clamps.
- The insulation of the mains lead should be checked for external damage.
- The mains lead strain relief should be checked for its function in order to avoid touching the CRT, hot components or heat sinks.
- The electrical DC resistance between the mains plug and the secondary side should be checked (only for sets which have a mains isolated power supply). This check can be done as follows:
  - unplug the mains cord and connect a wire between the two pins of the mains plug;
  - set the mains switch to the on position (keep the mains cord unplugged!);
  - measure the resistance value between the pins of the mains plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 M $\Omega$  and 12 M $\Omega$ ;
  - switch off the TV and remove the wire between the two pins of the mains plug.
- The cabinet should be checked for defects to avoid touching of any inner parts by the customer.

#### Maintenance instructions


It is recommended to have a maintenance inspection carried out by a qualified service employee. The interval depends on the usage conditions:

- When the set is used under normal circumstances, for example in a living room, the recommended interval is 3 to 5 years.
- When the set is used in circumstances with higher dust, grease or moisture levels, for example in a kitchen, the recommended interval is 1 year.

The maintenance inspection contains the following actions:

- Execute the above mentioned 'general repair instruction'.
- Clean the power supply and deflection circuitry on the chassis.
- Clean the picture tube panel and the neck of the picture tube.

#### Warnings


1. In order to prevent damage to ICs and transistors, all high-voltage flashovers must be avoided. In order to prevent damage to the picture tube, the method shown in Fig. 3.1 should be used to discharge the picture tube. Use a high-voltage probe and a multimeter (position DC-V). Discharge until the meter reading is 0V (after approx. 30s).
2. **ESD**  All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.

#### Available ESD protection equipment:

anti-static table mat;	
large 1200x650x1.25mm	4822 466 10953
anti-static table mat;	
small 600x650x1.25mm	4822 466 10958
anti-static wristband	4822 395 10223
connection box	
(3 press stud connections, 1 M $\Omega$ )	4822 320 11307
extension cable (2 m, 2 M $\Omega$ ;	
to connect wristband to connection box)	4822 320 11305
connecting cable (3 m, 2 M $\Omega$ ;	
to connect table mat to connection box)	4822 320 11306
earth cable (1 M $\Omega$ ; to connect any	
product to mat or connection box)	4822 320 11308
complete kit ESD3 (combining all 6 prior	
products; small table mat)	4822 310 10671
wristband tester	4822 344 13999

3. Together with the deflection unit and any multipole unit, the flat square picture tubes used from an integrated unit. The deflection and the multipole units are set optimally at the factory. Adjustment of this unit during repair is therefore not recommended.
4. Be careful during measurements in the high-voltage section and on the picture tube.
5. Never replace modules or other components while the unit is switched on.
6. When making settings, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

#### Notes

1. The direct voltages and oscillograms should be measured with regard to the tuner earth ( $\perp$ ), or hot earth ( $\perp$ ) as this is called.
2. The direct voltages and oscillograms shown in the diagrams are indicative and should be measured in the **Service Default Mode** (see chapter 6) with a colour bar signal and stereo sound (L:3 kHz, R:1 kHz unless stated otherwise) and picture carrier at 475.25 MHz.
3. Where necessary, the oscillograms and direct voltages are measured with (T) and without aerial signal (X). Voltages in the power supply section are measured both for normal operation (D) and in standby (C). These values are indicated by means of the appropriate symbols.
4. The picture tube PWB has printed spark gaps. Each spark gap is connected between an electrode of the picture tube and the Aquadag coating.
5. The semiconductors indicated in the circuit diagram and in the parts lists are completely interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.
6. Manufactured under license from Dolby Laboratories Licensing Corporation.  
DOLBY, the double D symbol  and PRO LOGIC are trademarks of Dolby Laboratories Licensing Corporation.

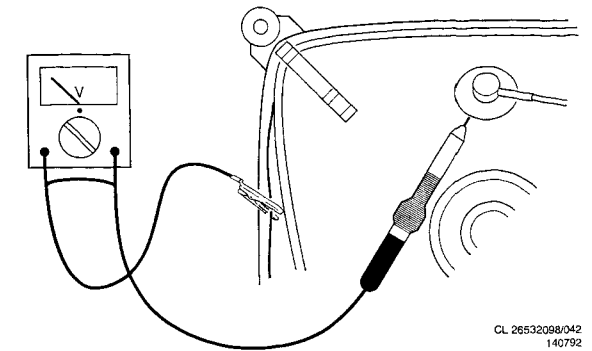


Fig. 3.1

### 4. Mechanical instructions

For the main carrier two service positions are possible (Fig. 4.1):

- A: For faultfinding on the component side of the main carrier.
- B: For (de)soldering activities on the copper side of the main carrier.

Position A can be reached by first removing the mains cord from its fixation, then loosen the carrier lips (1) and then pulling the carrier panel (2) for approximately 10 cm.

Position B can be reached from position A after disconnecting the degaussing cable.

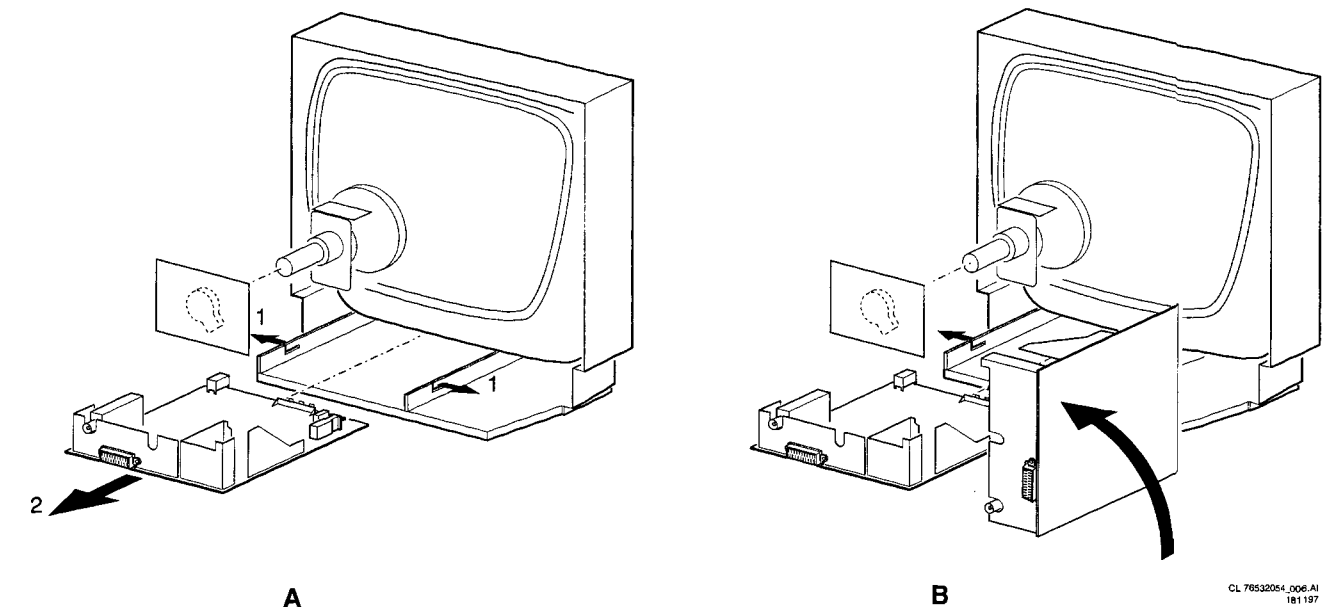
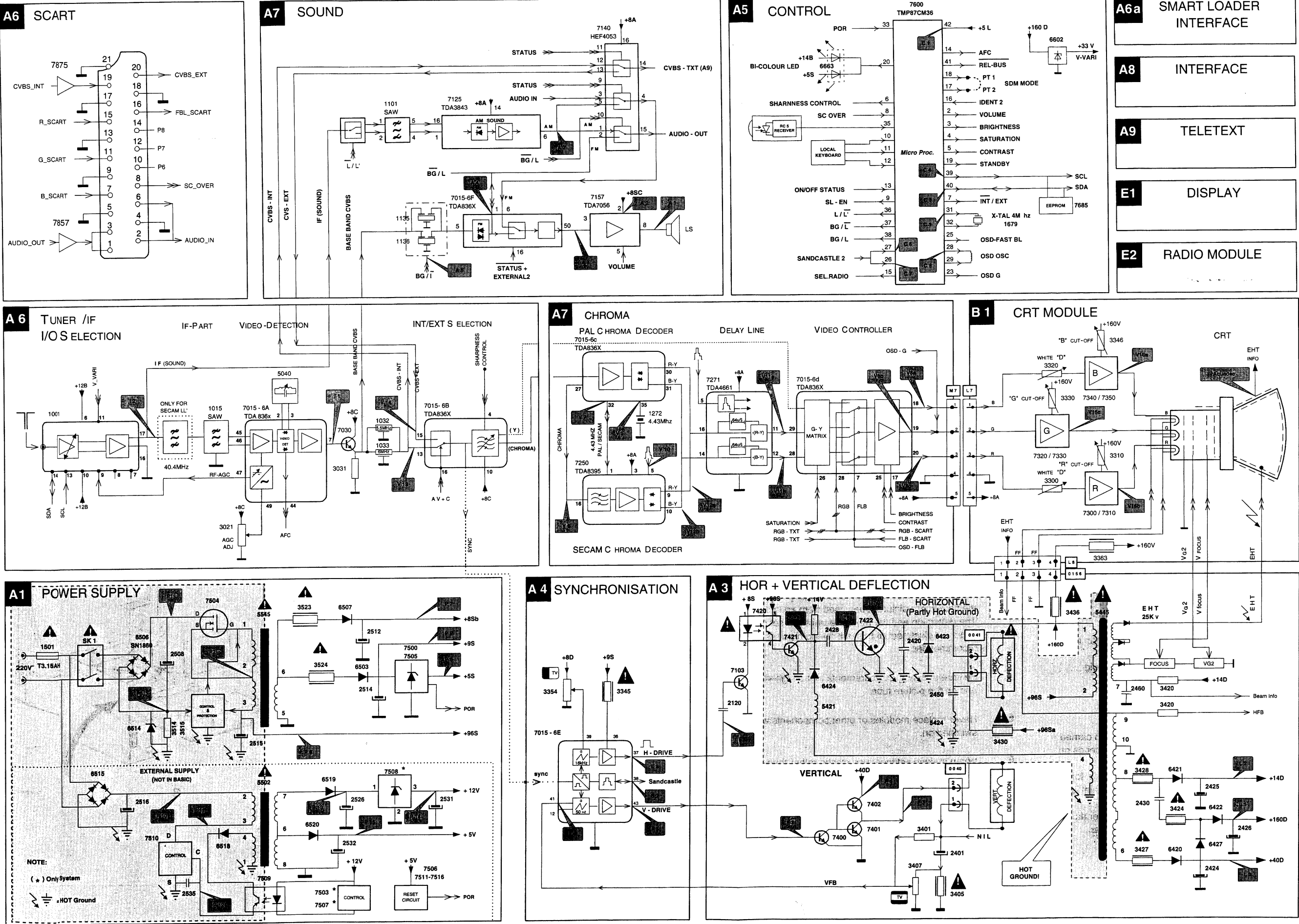
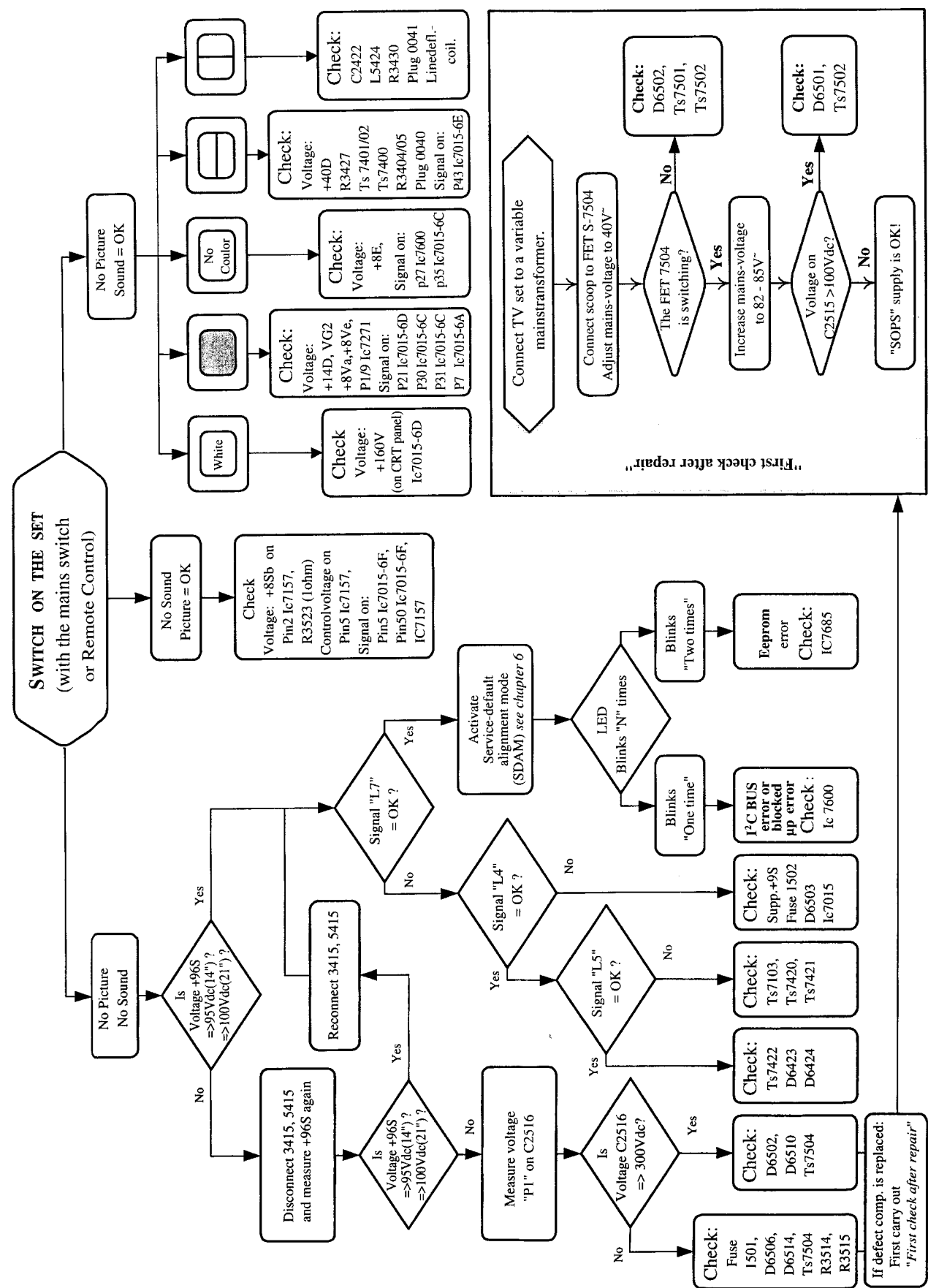


Fig. 4.1





6. Fault finding tree & Repair facilities /  
Fehlersuchbaum & Reparaturhinweise /  
Aide au depannage & Conseils pour la réparations



Repair facilities

1. Functional blocks

On both the service printing on the copper and the component side, functional blocks are indicated by lines and text.

2. Test points

The AA5H chassis is equipped with test points in the service printing on both sides of mono-board. These test points are referring to the functional blocks as mentioned above:

- \* P1-P2-P3, etc: Test points for the power supply
- \* L1-L2-L3, etc: Test points for the line drive and line output circuitry
- \* F1-F2-F3, etc: Test points for the frame drive and frame output circuitry
- \* S1-S2-S3, etc: Test points for the synchronisation circuitry
- \* V1-V2-V3, etc: Test points for the video processing circuitry
- \* A1-A2-A3, etc: Test points for the audio processing circuitry
- \* C1-C2-C3, etc: Test points for the control circuitry
- \* T1-T2-T3, etc: Test points for the teletext processing circuitry

The numbering is done in a for diagnostics logical sequence; always start diagnosing within a functional block, in the sequence of the relevant test points, for that functional block.

3. Service default-alignment mode (SDAM)

The service default-alignment mode is a pre-defined mode which can be used for faultfinding (especially when the TV gives no picture at all). All oscillograms and DC voltages in this service manual are measured in the service default-alignment mode. Alignment (if present) are also done in this mode.

Activate the service default-alignment mode can be done in 2 ways:

1. By short-circuiting the service pins PT1 and PT2 of the microcomputer (pin 14 of IC7600) while pressing the mains-switch.
2. From normal operation mode by pressing the button "DEFAULT" or "ALIGN" on the DST (Dealer Service Tool) RC7150.

Leaving the service default-alignment mode to normal operation can only be done by the stand-by on the remote control or by pressing diagnose 99 followed by the OK-button on the DST (so not via mains switch "off"; after mains switch "off" and then "on" again the set will start up in the service default-alignment mode again to enable easy faultfinding).

"S" for service menu active →

Option code + Counter + Software version →

Error code history →

Functions of the service default-alignment mode:

1. All analogue settings (volume, contrast, brightness and saturation) are in the mid position.
2. Set is tuned to 475.25 Mhz.
3. Delta volume settings are not used (delta volume setting = a delta on the volume setting).
4. OSD error message (present available error code) is displayed continuously.
5. The +key and the -key of TV will act as search and auto store on the maximum program number.
6. Automatic switch off function (set switches "off" after 15 minutes no IDENT) will be switched off.
7. Hotel mode will be disabled.
8. All other functions remain normal controllable.
9. Software version of the microprocessor used in that typical set is displayed in the right top corner.
10. A counter in the middle of the screen indicate the normal operation hours of the set in a hexadecimal code (every time the set is switched "on" the counter is incremented by 1 hour, so +1 at the counter).
11. The "S" in the middle of the screen above the counter indicate that the set is in the service default-alignment mode.
12. Option code  
This code indicates the Options setting of the set.
13. Error code history:  
The 5 last different error codes occurred are stored in the EEPROM memory; last error code detected will be displayed on the left side (see for an overview of all possible error codes Fig. 6.3), so e.g.:

0 0 0 0	means no error codes present in the buffer.
3 0 0 0	means one error code present in the buffer; error code 3.
2 3 0 0	means two error codes present in the buffer; last detected error code is error code 2, previous detected error code is error code 3.

The error code history buffer is cleared when the Service Menu is left by the stand-by command or by diagnose 99 command. In case the Service Menu is left by the mains switch "off" the error code history buffer will not be cleared. With commands diagnose 1..5 on the DST it is possible to read out the error-buffer. This can be done on the following manner:

- press the diagnose button on the DST.
- press the number of the error position you want to read.
- press the OK-button on the DST.

Diagnose 1 is the most actual error. So the left position of the error-buffer. Diagnose 5 displays the most right position of the error-buffer. If there is an error on the selected position the led will blink twice the error code. The error code on the DST has to be ignored. Diagnose 1..5 is an powerfull tool to read out the error-buffer when there is no picture.

	S	
F4	003C	1.0
	23000	

Fig. 6.1



## Repair facilities

## Mapping main chassis

### 4. Option setting

All option setting are done in the normal menus. These menus can be selected by selecting the maximum TV-channel followed by pushing the volume/program selection button and at the same time pressing the volume-minus button for more than four seconds. With cursor up/down one of the items can be selected. With cursor right/left the items can be changed. New option settings are activated immediately. The following options can be chosen:

System	SINGLE	For a BG,DK or BG/DK set.
	MULTI F	For a BG+L+I set.
	UHF	For a I, UHF only set.
Teletext	YES/NO	Teletext can be selected yes or no.
Clock	YES/NO	Clock can be selected yes or no.
Radio	INT	To select internal radio tuner.
	EXT	This means that the radio is external. In this way TV-presets could be used as radio. The installation of these kind of programs is the same as for TV programmes. Radio channels can be modulated by the system installer on TV frequencies.
	NO	No radio available.

### 5. Option code

The option code is built up with 8 bits. The following table explains which option influences which bit.

BIT	Description
0 (LSB)	Not used
1	Interface system 0=non system 1=system
2	Radio internal 1=radio present
3	Not used
4	Clock 1=clock present
5	Teletext 1=txt present
6	Tv-system
7 (MSB)	Tv-system

Fig. 6.2

#### Tv-system (bit 7 and bit 6)

00 = single PAL  
01 = PAL I  
10 = not used  
11 = MULTI-F

"OSD error number" (Service Menu)	"LED behaviour"	Error description	Possible defective component
0	No led blinking	No error	
1	LED blinks once	General I <sup>2</sup> C bus	
2	LED blinks twice times	Eeprom error	IC7685
3	LED blinks three times	TXT-error	IC7700 / 7990 / wrong option
4	LED blinks four times	PLL-tuner error	Item 1001 / wrong option
5	LED blinks five times	Radio-module error	IC7904 / item 1910 / wrong option
6	LED blinks six times	Display error	IC7951

Fig. 6.3

**Example:** option code F4 (hexadecimal presented) means a full multi set non system with teletext, clock and internal radio. F4 is in binair 1111 0100.

### 6. Error messages

The microcomputer also detects errors in circuits connected to the I<sup>2</sup>C (Inter IC) bus. These error messages are communicated via OSD (On Screen Display) and a flashing LED in the service default-alignment mode. (error code history buffer):

- In normal operation:  
In normal operation no errors are indicated.
- In the service default-alignment mode:  
In the service default-alignment mode both the "OSD error code" and the "LED error" indication will display the present detected error twice.

### 7. Hotel mode

#### 7.1 Hotel-mode "on"

To enter to hotel mode a setting must be changed in the installation menu.

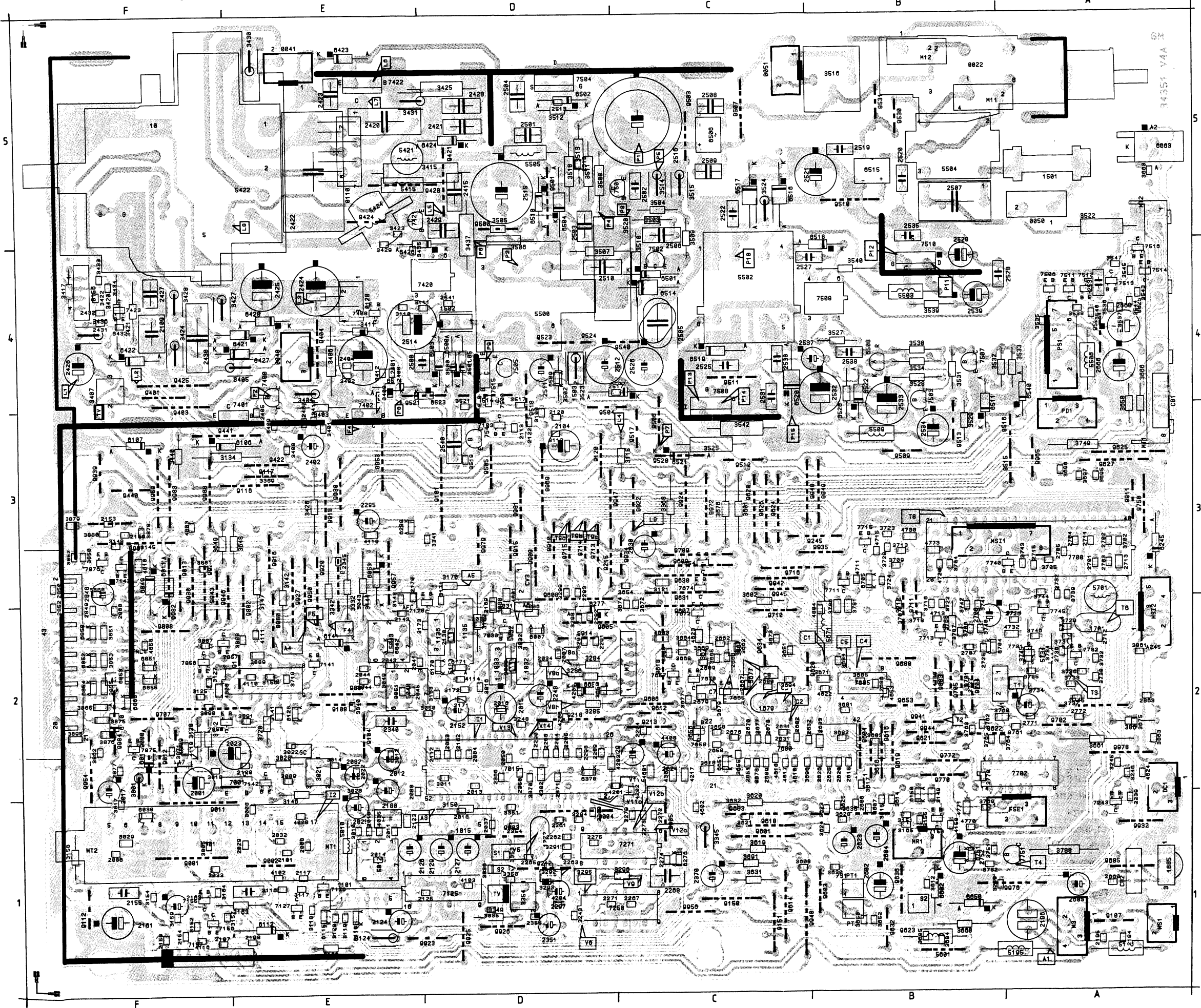
#### 7.2 Fuction of the hotel mode

- Volume cannot be increased above the maximum level installed.
- Store open/close is ignored, message "LOCKED" is shown.
- Local keys are blocked. If the blocking option is set, a message "LOCKED" is shown when a local key is pressed.
- All protected programs cannot be selected. To free protected programmes the remote control key "PIP on/off" must be pressed or the relevant menu item must be changed. This key works as a toggle function.

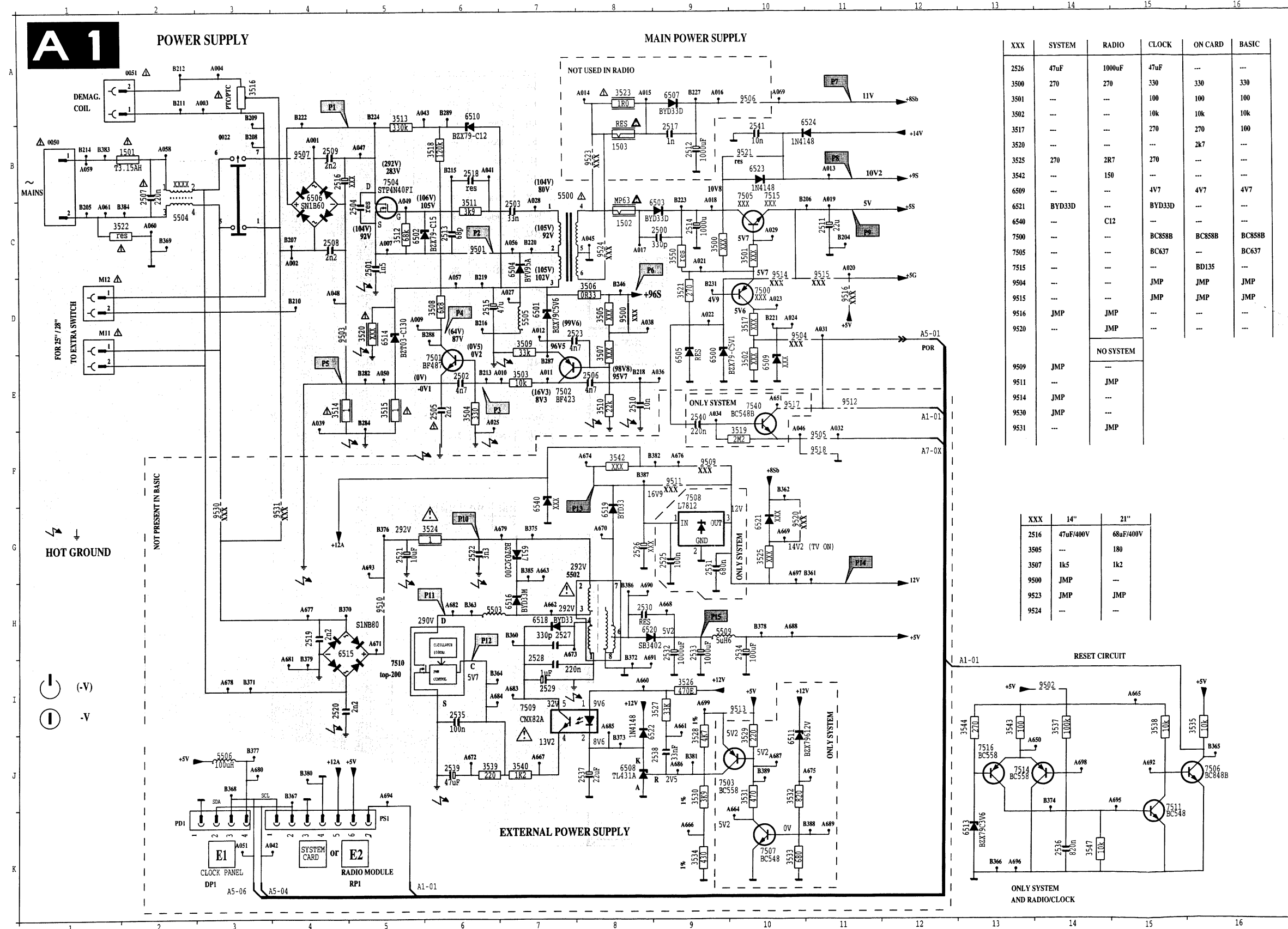
#### 7.3 Hotel-mode "off"

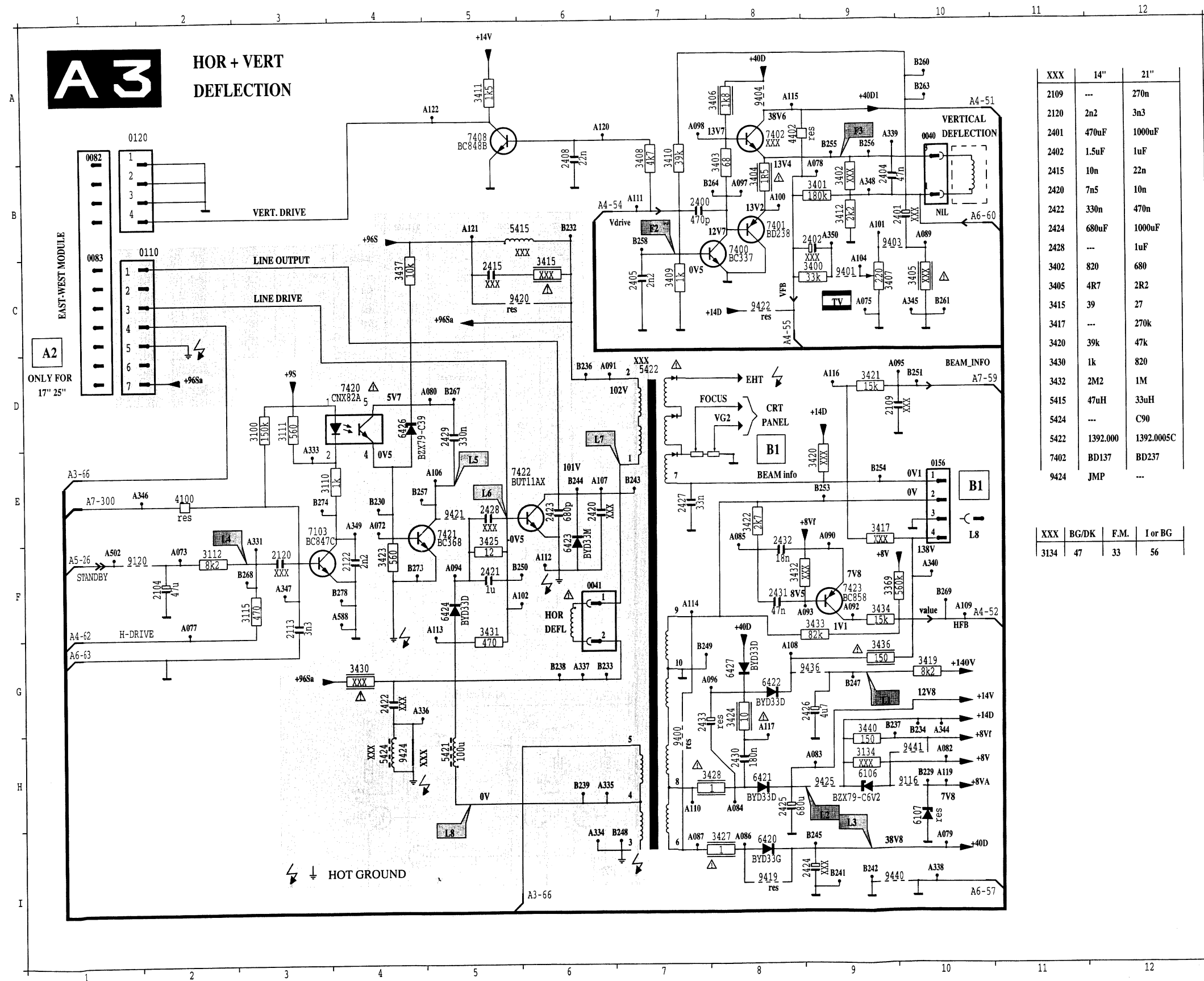
To leave to hotel mode a setting must be changed in the installation menu. Same setting as in the Hotel-mode "on".

0022	B	2263	D1*	2615	B2*	3121	C3*	3436	F4	3672	C2*	4003	F3*	6420	E4	7665	C2*	9616	B2	CB2	A1
0025	A4	2265	D1*	2620	B2*	3124	E1	3437	D4	3673	C2*	4006	D2*	6421	E4	7670	C2*	9618	C2	CV1	A2
0040	E4	2267	C1*	2623	B1*	3125	F2*	3440	F3	3674	C2*	4008	E1*	6422	F4	7672	C2*	9619	B2	CV3	D3
0041	E5	2268	C1	2624	C2	3126	F2	3500	D4*	3675	A2*	4035	E1*	6423	E5	7674	C3*	9620	B2	DC1	A1
0043	F2	2271	C1*	2625	B2*	3127	E2*	3501	D4*	3676	C3	4102	E1*	6424	D5	7685	B2	9621	B2	FSE1	A1
0050	A5	2272	C1*	2626	B2*	3134	E3	3502	D4	3677	C2*	4103	D1*	6426	D4	7700	A3	9622	A2	M11	A5
0051	B5	2273	C1*	2629	C2	3141	E2*	3503	C4	3678	C2*	4110	E2*	6427	E4	7702	A2	9623	B1	M12	B5
0110	E5	2274	C1*	2630	C3	3142	E3	3504	C5	3679	C2*	4111	E2*	6500	D4	7711	B3*	9624	C3	M3	A1
0120	E4	2275	D1*	2631	C2*	3143	E3*	3505	D4	3680	C2*	4114	D2*	6501	C4	7713	B2*	9625	A3	M7	C2
0156	F4	2279	C1*	2632	B2*	3144	E3	3506	D4	3681	B2*	4116	F1*	6502	D5	7715	B3*	9626	C3	ML1	F3
1001	F1	2280	D1*	2633	B2*	3145	F3*	3507	C4	3682	B2*	4118	F2*	6503	D4	7731	A2*	9627	A3	ML2	F3
1015	D1	2283	D2*	2651	C2*	3146	E2	3508	C5	3683	B2*	4119	E3*	6504	D5	7732	A2	9628	C3	ML3	F3
1032	D2	2284	D2*	2658	C2*	3147	E3	3509	C4	3684	B2*	4150	B1*	6505	D4	7740	A3*	9630	C3	ML4	F2
1033	D2	2285	D2*	2660	A1*	3148	F3*	3510	C4	3685	B2*	4201	C2*	6506	C5	7745	A2*	9631	C3	ML5	F2
1101	E1	2289	C2*	2662	C2*	3149	B1*	3511	D5	3691	C1	4202	C2*	6507	C4	7751	A1	9632	B1	MR1	B1
1135	D2	2290	D2*	2663	C2*	3150	D1	3512	D5	3694	C2*	4203	C2*	6508	B4	7856	F2*	9633	C1	MS1	A1
1136	D2	2291	C2*	2666	A4	3151	B1*	3513	D5	3695	A3*	4204	D1*	6509	D4*	7857	E2*	9634	C2	MS1 A3	
1272	D1	2292	D2*	2667	C2*	3152	F1*	3514	C5	3696	A3*	4208	D2*	6510	D5	7858	E2*	9635	B1	MS12	A2
1501	A5	2293	D3*	2668	A4	3153	D2*	3515	C5	3697	A3*	4209	D2*	6511	A3	7875	F2*	9636	B1	PD1	A3
1502	D4	2294	C2*	2669	C2*	3154	F1*	3516	B5	3698	B2*	4217	C2*	6514	C4	7876	F3*	9653	B2	PS1	A4
1503	D4	2295	E3	2670	C2*	3155	B1*	3517	D4*	3702	A3*	4302	D2*	6515	B5	9000	F2	9680	B2	PT1	B1
1679	C2	2297	D1	2676	C2*	3156	E2*	3518	D5	3704	B3*	4303	C2*	6516	C5	9001	F1	9685	A1	PT2	B1
1685	A1	2298	D2*	2677	C2*	3157	E1*	3519	D3*	3705	A3*	4408	C2*	6517	C5	9002	E1	9701	B2	S2	B1
1701	A2	2340	E2	2678	C2*	3158	F1	3520	C4	3706	B2*	4601	C2*	6518	B4	9003	D1	9702	A2		*= Chip component
2001	F2	2345	E3*	2679	C2*	3159	F1*	3521	D4*	3707	B2*	4602	C1*	6519	C4	9004	D1	9704	B2		
2006	F1*	2350	D2*	2680	C2*	3163	E1	3522	A4	3709	B3*	4603	C2*	6520	B4	9005	C1	9705	B2		
2007	D2*	2351	D1	2681	C2*	3164	E1*	3523	D4	3713	B3*	4616	B2*	6521	C3	9007	E2	9707	F2		
2008	E1*	2354	D1*	2682	B2*	3165	B1*	3524	C4	3714	A2*	4617	C2*	6522	B4	9008	F2	9708	E2		
2010	E1*	2355	D1*	2685	A1	3169	D2	3525	C3	3716	B2*	4618	C2*	6523	D4	9009	F2	9709	C3		
2011	E1	2366	D2*	2686	B2*	3170	D3	3526	B4	3718	B2*	4622	B2*	6524	E4	9011	F1	9710	C2		
2012	E2	2370	C1	2689	C2*	3171	D3*	3527	B4	3719	E2*	4623	C2*	6540	A4	9012	F2	9711	B2		
2013	D2*	2371	D2*	2701	A3*	3172	D2*	3528	B4	3720	E2	4624	A2*	6602	B1	9013	F3	9712	B2		
2014	E1*	2400	E3*	2702	A3*	3173	D2*	3529	B3	3722	B2*	4653	B2*	6650	B1	9101	D3	9713	C3		
2015	D2	2401	E4	2703	A3*	3198	E1	3530	B4	3723	B3*	4711	B3*	6651	C2*	9104	E2	9714	D3		
2016	D2	2402	E3	2704	A3*	3243	D1*	3531	B4	3724	B3*	4713	B2*	6658	D2	9107	A1	9715	D3		
2017	F2	2404	E4*	2705	A3*	3245	A2*	3532	A4	3728	B3*	4715	B3*	6704	A2*	9108	E2	9716	B3		
2018	D1*	2405	E3*	2706	A2	3246	A2*	3533	A4	3729	A2*	4720	B3*	6705	B3*	9111	E2	9745	A2		
2022	E2*	2408	E4*	2707	B2*	3248	D2*	3534	B4	3731	A2*	4730	B3*	6751	B1*	9112	F1	9750	A3		
2023	E2	2415	D5	2711	A3*	3259	A1*	3535	A4*	3732	A2*	4732	A2*	6849	F3	9116	E3	9770	B2		
2025	E1	2420	E5	2712	A2*	3284	D2	3536	A4*	3733	A2*	4738	B2*	6850	F2*	9117	E3	9772	B2		
2029	E1*	2421	D5	2713	A3*	3285	D2	3537	A4*	3734	A2*	4770	B1*	6851	F2*	9120	C3	9802	E3		
2030	D2*	2422	E5	2715	A3*	3286	D2	3538	A4*	3735	A2*	4771	B1*	6852	F2*	9150	C1	9803	B2		
2031	E1	2423	E5	2725	A2*	3291	D1*	3539	B4	3736	A2*	4773	B3*	6853	F2*	9151	C1	9909	D3		
2032	E1*	2424	E4	2726	A2*	3292	D1*	3540	B4	3737	A2*	4804	B2*	6854	F2*	9212	D1	9910	D3		
2033	E1*	2425	E4	2727	B2*	3293	D1*	3542	C3	3738	A2*	4808	E2*	6855	F2*	9213	C2	9911	A3		
2034	D2*	2426	F4	2732	A3*	3294	D1*	3543	A4*	3739	A3*	4810	F3*	6865	F2*	9215	C3	9914	D2		
2037	D1*	2427	F4	2734	A2	3295	D1*	3544	A4*	3740	B2*	4853	F2*	7001	E2	9218	D2	9915	D3		
2041	D2*	2428	D5	2736	A2*	3296	C1	3545	A4*	3741	B2*	5010	E1	7015	D2	9245	B3	9916	E3		
2043	E2*	2429	D4	2752	B1	3297	D2*	3546	A4*	3742	E2*	5012	E1	7030	D2*	9401	F4	9918	E3		
2044	E2*	2430	F4	2771	A2*	3298	D2*	3547	A4*	3743	A3*	5032	D2	7103	D3*	9403	F4	9920	E3		
2045	D2*	2431	F4*	2772	A2*	3299	D3*	3601	C3	3744	A3*	5040	D2	7125	D1	9404	E4	9922	C3		
2050	D2*	2432	F4*	2848	F3	3332	E3	3602	C2	3745	A2	5043	E2	7126	E1	9420	D5	9923	D1		
2053	D2*	2500	D4	2849	F2*	3340	E2*	3604	B1*	3746	A2*	5130	D2	7127	E1*	9421	D5	9924	C3		
2080	D2*	2501	D5	2850	F3*	3341	D3*	3605	B1*	3749	A3	5195	A1	7140	E2	9422	E3	9925	D1		
2082	E2	2502	C5	2852	F2*	3342	E3	3607	B1*	3751	A1*	5196	A1	7141	E2*	9424	E4	9926	D1		
2084	D2*	2503	D4	2860	F2*	3345	C1	3608	B1*	3752	A1*	5415	D5	7142	E2*	9425	F4	9927	E3		
2101	E1*	2504	D5	2863	A2*	3349	D1	3612	B1*	3760	A2*	5421	D5	7143	F3*	9440	F3	9928	F3		
2104	D3	2505	C4	2877	F2*	3350	D1*	3614	B1*	3761	A2*	5422	E5	7150	B1*	9441	E3	9930	E3		
2109	F4	2506	C4	3001	F2	3351	D1*	3615	B1*	3762	B2*	5424	E4	7155	F1*	9500	D4	9932	A1		
2112	D2*	2507	B5	3005	F1*	3353	D1*	3616	B2	3763	B2*	5500	D4	7156	E1*	9501	D5	9934	C3		
2113	D3*	2508	C5	3008	E1*	3354	D1	3617	B2*	3764	A2*	5502	C4	7157	F1	9502	A4	9935	B3		
2117	E1*	2509	C5	3009	E2*	3368	C3	3618	C2*	3765	A2*	5503	B4	7170	D2*	9503	C5	9937	F3		
2120	D3*	2510	C4	3010	E1*	3369	E3*	3619	C1	3768	B2	5504	B5	7243	A1*	9504	C3	9938	F3		
2122	D3*	2511	D4	3011	D2*	3370	D2*	3620	C1	3769	A1*	5505	D5	7250	C1	9505	D3	9939	F3		
2123	D1*	2512	C4	3012	E2*	3400	E3*	3621	C1*	3770	B2*	5506	A4	7271	C1	9506	C3	9940	B1		
2124	E1	2513	D5*	3014	E2*	3401	E3*	3623	B1*	3781	B2*	5509	B3	7400	E4	9507	C5	9941	B2		
2125	D1*	2514	D4	3016	D2*	3402	E4*	3624	B1*	3786	B2*	5601	B1	7401	E3	9509	B3	9942	C3		
2126	D1	2515	D5	3017	F1*	3403	E4	3625	B1*	3787	B2*	5671	B2	7402	E3	9510	B5	9943	E3		
2127	D1	2516	C5	3018	E2*	3404	E4	3628	B1*	3788	A1	5677	C2	7408	E4*	9511	C4	9944	B2		
2128	E2*	2517	C4*	3020	E2	3405	E4	3630	B1*	3850	F3*	5701	A2	7420	D4	9512	C3	9945	C3		
2129	D1	2518	D5*	3021	E2	3406	E4	3631	C1	3851	F2*	5704	A2	7421	D4	9513	B3	9946	E3		
2130	D2*	2519	B5	3022	E2*	3407	F4	3632	C1*	3852	F3*	5734	A2	7422	E5	9514	D4	9947	C3		
2143	D2*	2520	B5	3023	E1*	3408	E4*	3648	E3	3853	F2*	5999	E5	7423	F4*	9515	A3	9948	B3		
2152	D2	2521	B5	3029	F1*	3409	E3*	3649	E3	3855	F2*	6007	D2*	7500	D4*	9516	A3	9949	B3		
2153	F3*	2522	C4	3030	D2	3410	E3*	3650	A3	3860</											







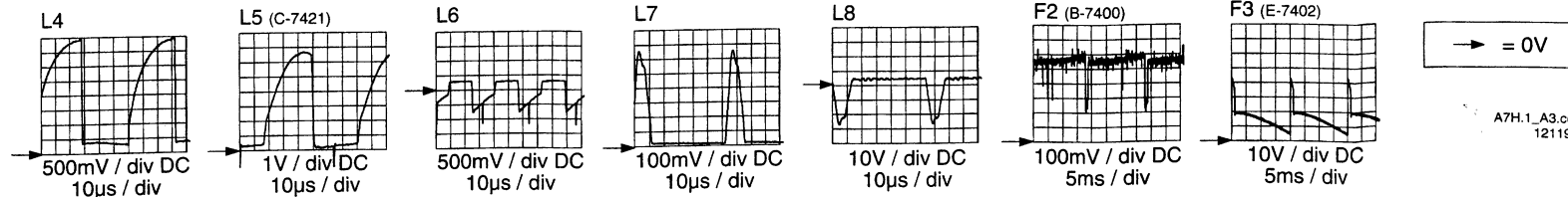


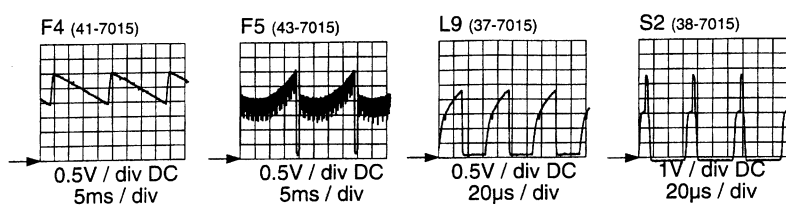
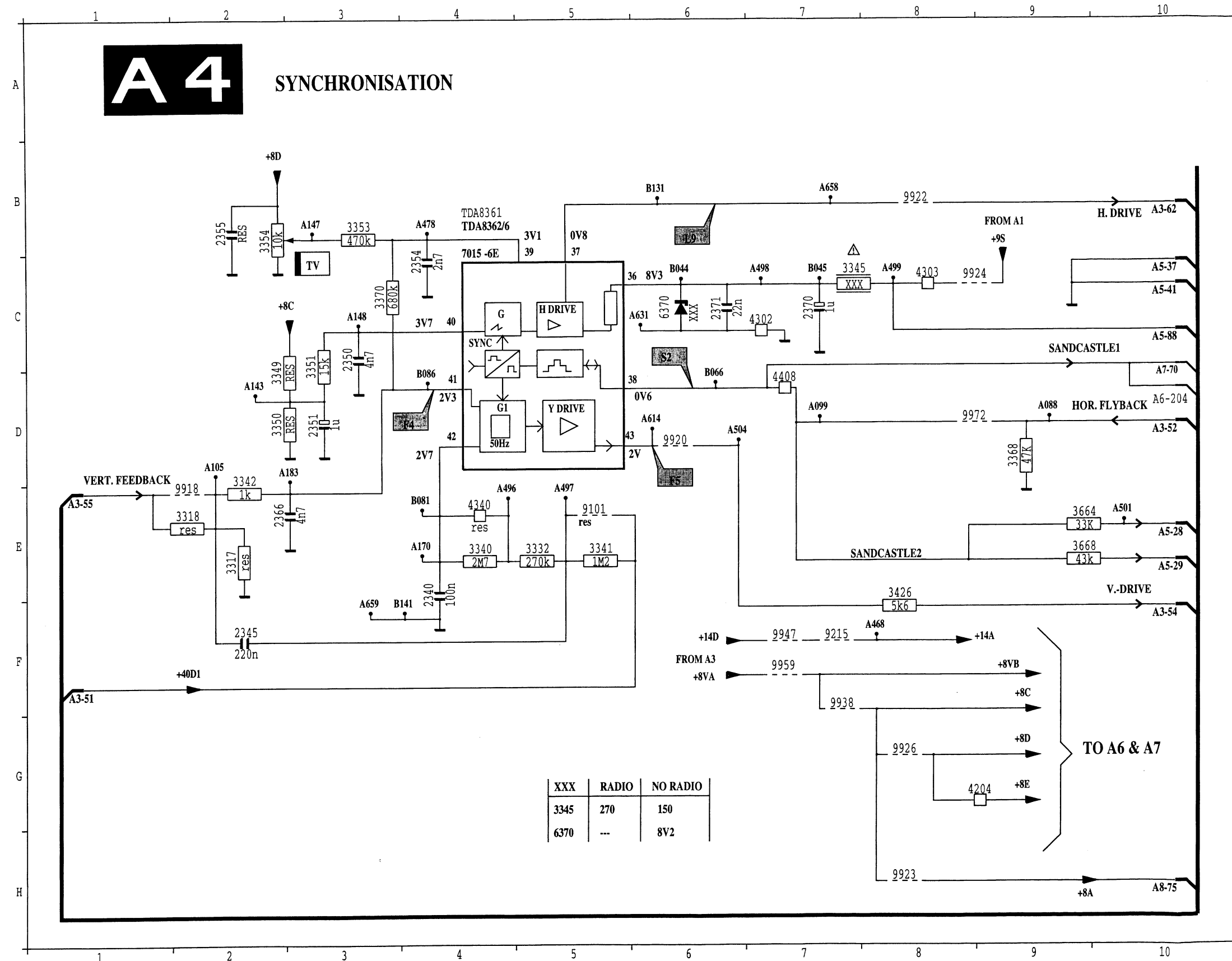
XXX	14"	21"
2109	---	270n
2120	2n2	3n3
2401	470uF	1000uF
2402	1.5uF	1uF
2415	10n	22n
2420	7n5	10n
2422	330n	470n
2424	680uF	1000uF
2428	---	1uF
3402	820	680
3405	4R7	2R2
3415	39	27
3417	---	270k
3420	39k	47k
3430	1k	820
3432	2M2	1M
5415	47uH	33uH
5424	---	C90
5422	1392.000	1392.0005C
7402	BD137	BD237
9424	JMP	---

XXX	BG/DK	F.M.	I or BG
3134	47	33	56

0040	A10	7420	D 4	B248	I 7
0040	A10	7421	D 5	B249	I 7
0040	A10	7422	E 5	B250	G 7
0041	B 6	7423	F 6	B251	D10
0041	B 6	7424	F 7	B252	E 9
0110	B 1	9116	H10	B253	E 9
0110	D 2	9120	F 1	B254	A 9
0110	C 2	9400	H 7	B255	A 9
0110	C 2	9401	B 9	B256	A 9
0110	C 2	9403	B 8	B257	E 4
0110	C 2	9404	A 8	B258	A 9
0110	C 2	9419	I 5	B260	A10
0120	A 1	9420	E 1	B261	C10
0120	B 2	9421	C 8	B263	A10
0120	B 2	9422	A 5	B264	A10
0120	B 2	9423	H 4	B267	D 7
0156	E10	9436	G 9	B269	F10
0156	E10	9440	H 9	B273	F 4
0156	E10	9441	I 9	B274	F 4
2104	F 2	A3-66	E 1	B278	F 4
2109	D 9	A3-66	E 1		
2113	F 3	A4-51	A10		
2120	F 3	A4-52	F10		
2122	F 4	A4-54	C 8		
2400	B 7	A4-55	B 8		
2401	B10	A4-62	F 1		
2402	B 9	A5-26	F 1		
2404	B 9	A6-57	H10		
2408	B 9	A6-50	G 1		
2419	B 9	A6-30	E 1		
2420	E 6	A7-59	D10		
2421	F 5	A7-72	E 2		
2422	G 4	A7-73	F 4		
2423	E 6	A7-75	F 2		
2424	I 1	A7-77	F 9		
2426	H 9	A7-78	I10		
2427	E 5	A8-80	D 5		
2428	E 5	A8-82	H10		
2430	D 3	A8-83	H 9		
2431	H 9	A8-84	H 9		
2432	H 9	A8-85	H 9		
2433	F 7	A8-87	I 7		
3100	D 3	A8-89	B10		
3110	E 3	A9-90	F 9		
3111	D 3	A9-91	D 6		
3112	F 2	A9-92	F 9		
3115	F 3	A9-93	F 9		
3134	H 9	A9-94	F 9		
3369	E 9	A9-95	D 7		
3400	C 9	A9-96	G 7		
3401	E 9	A9-97	A 8		
3402	B 8	A9-98	A 8		
3403	B 8	A100	A 8		
3404	B 8	A101	A 8		
3405	C10	A102	E 5		
3406	A 8	A104	C 5		
3407	C 9	A106	E 6		
3408	A 7	A107	E 6		
3409	A 7	A108	G 8		
3410	A 7	A109	F10		
3411	A 5	A110	H 7		
3412	B 9	A111	B 7		
3415	C 6	A112	F 6		
3417	E 9	A113	F 7		
3419	G10	A114	F 9		
3420	E 9	A115	A 8		
3421	D 8	A116	E 9		
3422	D 8	A117	E 9		
3423	F 7	A119	H10		
3424	G 8	A121	B 5		
3425	E 5	A331	E 3		
3427	I 8	A333	D 3		
3428	H 8	A334	I 6		
3430	G 4	A335	H 6		
3431	E 5	A336	G 4		
3432	F 7	A337	G 6		
3433	F 7	A338	I10		
3434	F 9	A339	A 9		
3436	G 9	A340	F10		
3437	C 4	A344	H10		
4400	H 2	A348	C10		
4402	A 8	A347	E 9		
5415	B 6	A349	E 4		
5421	B 6	A350	B 9		
5422	D 1	A502	F 1		
5424	H 4	A588	F 4		
6106	H 9	B229	H10		
6107	H10	B230	E 4		
6420	I 1	B232	B 6		
6421	H 8	B233	G 6		
6422	G 8	B234	H10		

L1 140V DC  
L2 12V8 DC  
L3 38V6 DC





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PCS 91 671

A5

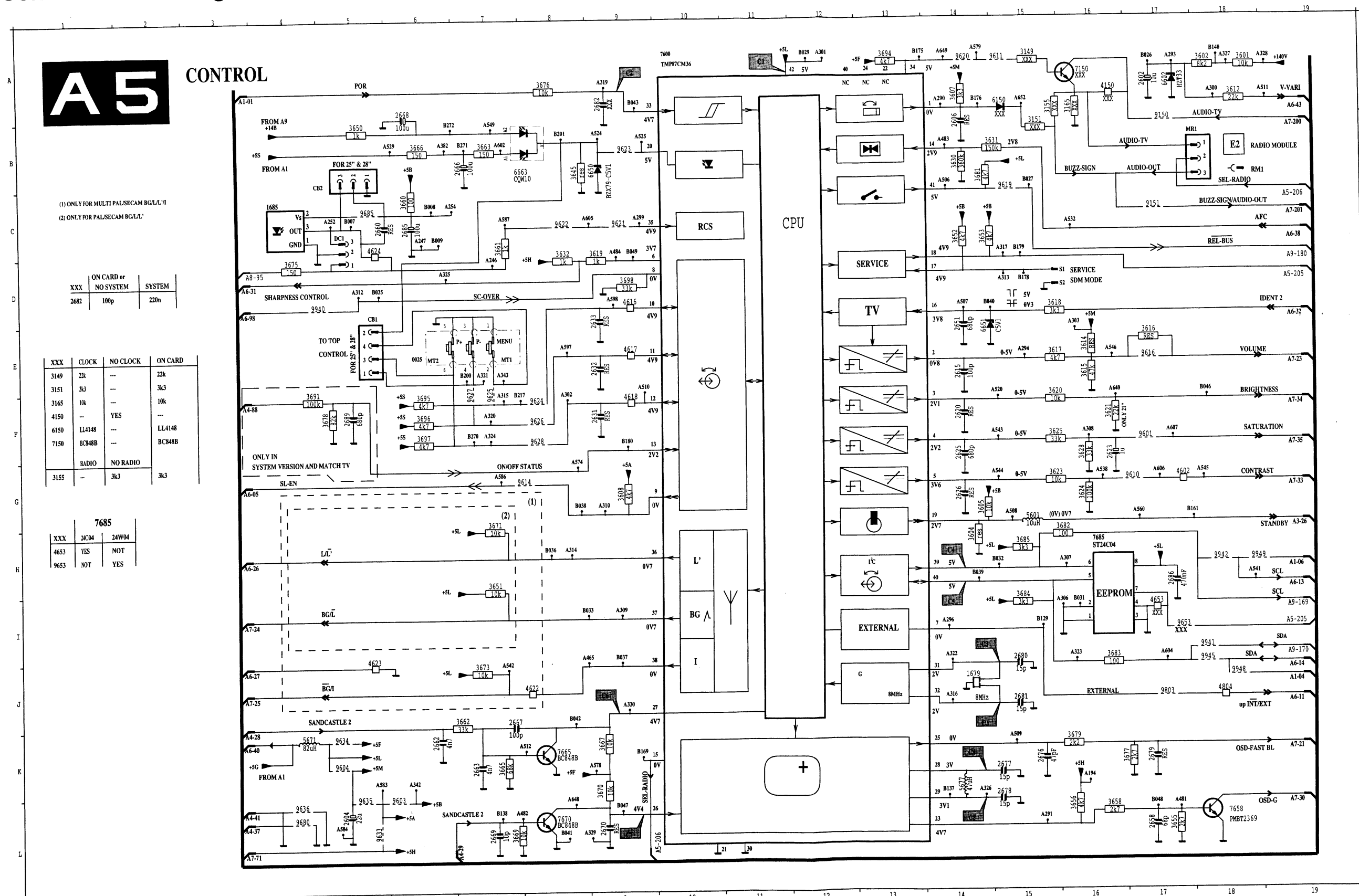
CONTROL

(1) ONLY FOR MULTI PAL/SECAM BG/L/L/L  
(2) ONLY FOR PAL/SECAM BG/L/L/L

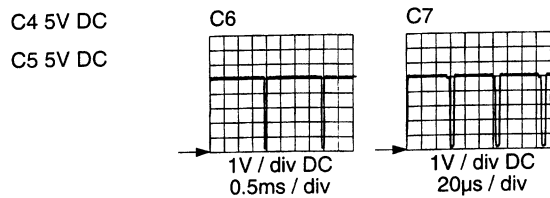
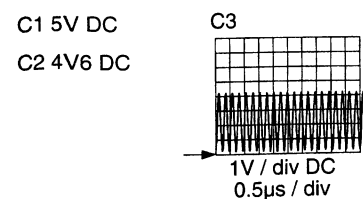
XXX	ON CARD or NO SYSTEM	SYSTEM
2682	100p	220m

XXX	CLOCK	NO CLOCK	ON CARD
3149	22k	---	22k
3151	3k3	---	3k3
3165	10k	---	10k
4150	---	YES	---
6150	LL4148	---	LL4148
7150	BC848B	---	BC848B
3155	RADIO	NO RADIO	3k3

XXX	7685
4653	YES
9653	NOT

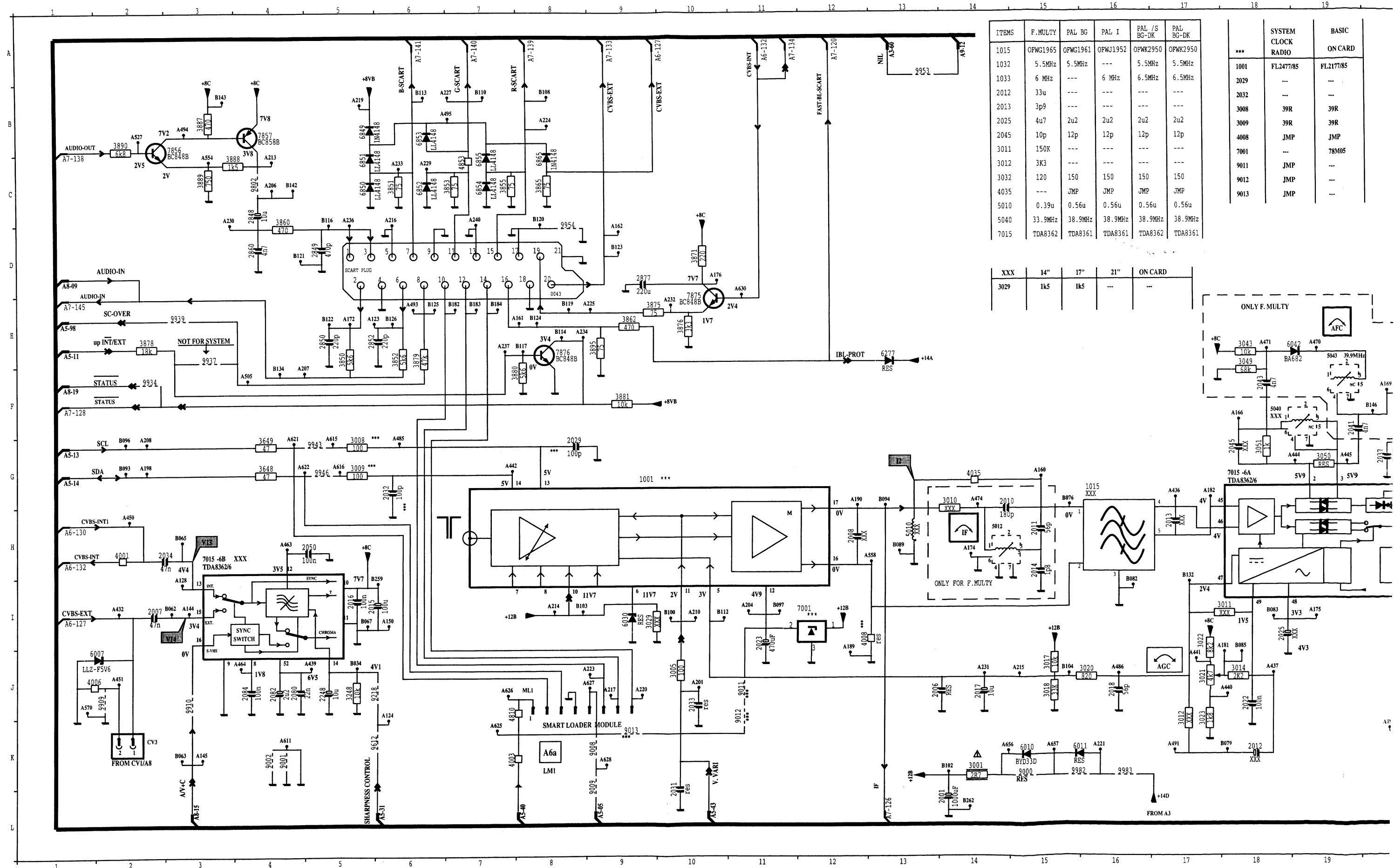


0025	B	9620	B	B175	A13
0026	B	9621	B	B176	A13
0027	B	9622	B	B177	A13
0028	B	9623	B	B178	A13
0029	B	9624	B	B179	A13
0030	B	9625	B	B180	A13
0031	B	9626	B	B181	A13
0032	B	9627	B	B182	A13
0033	B	9628	B	B183	A13
0034	B	9629	B	B184	A13
0035	B	9630	B	B185	A13
0036	B	9631	B	B186	A13
0037	B	9632	B	B187	A13
0038	B	9633	B	B188	A13
0039	B	9634	B	B189	A13
0040	B	9635	B	B190	A13
0041	B	9636	B	B191	A13
0042	B	9637	B	B192	A13
0043	B	9638	B	B193	A13
0044	B	9639	B	B194	A13
0045	B	9640	B	B195	A13
0046	B	9641	B	B196	A13
0047	B	9642	B	B197	A13
0048	B	9643	B	B198	A13
0049	B	9644	B	B199	A13
0050	B	9645	B	B200	A13
0051	B	9646	B	B201	A13
0052	B	9647	B	B202	A13
0053	B	9648	B	B203	A13
0054	B	9649	B	B204	A13
0055	B	9650	B	B205	A13
0056	B	9651	B	B206	A13
0057	B	9652	B	B207	A13
0058	B	9653	B	B208	A13
0059	B	9654	B	B209	A13
0060	B	9655	B	B210	A13
0061	B	9656	B	B211	A13
0062	B	9657	B	B212	A13
0063	B	9658	B	B213	A13
0064	B	9659	B	B214	A13
0065	B	9660	B	B215	A13
0066	B	9661	B	B216	A13
0067	B	9662	B	B217	A13
0068	B	9663	B	B218	A13
0069	B	9664	B	B219	A13
0070	B	9665	B	B220	A13
0071	B	9666	B	B221	A13
0072	B	9667	B	B222	A13
0073	B	9668	B	B223	A13
0074	B	9669	B	B224	A13
0075	B	9670	B	B225	A13
0076	B	9671	B	B226	A13
0077	B	9672	B	B227	A13
0078	B	9673	B	B228	A13
0079	B	9674	B	B229	A13
0080	B	9675	B	B230	A13
0081	B	9676	B	B231	A13
0082	B	9677	B	B232	A13
0083	B	9678	B	B233	A13
0084	B	9679	B	B234	A13
0085	B	9680	B	B235	A13
0086	B	9681	B	B236	A13
0087	B	9682	B	B237	A13
0088	B	9683	B	B238	A13
0089	B	9684	B	B239	A13
0090	B	9685	B	B240	A13
0091	B	9686	B	B241	A13
0092	B	9687	B	B242	A13
0093	B	9688	B	B243	A13
0094	B	9689	B	B244	A13
0095	B	9690	B	B245	A13
0096	B	9691	B	B246	A13
0097	B	9692	B	B247	A13
0098	B	9693	B	B248	A13
0099	B	9694	B	B249	A13
0100	B	9695	B	B250	A13



→ = 0V

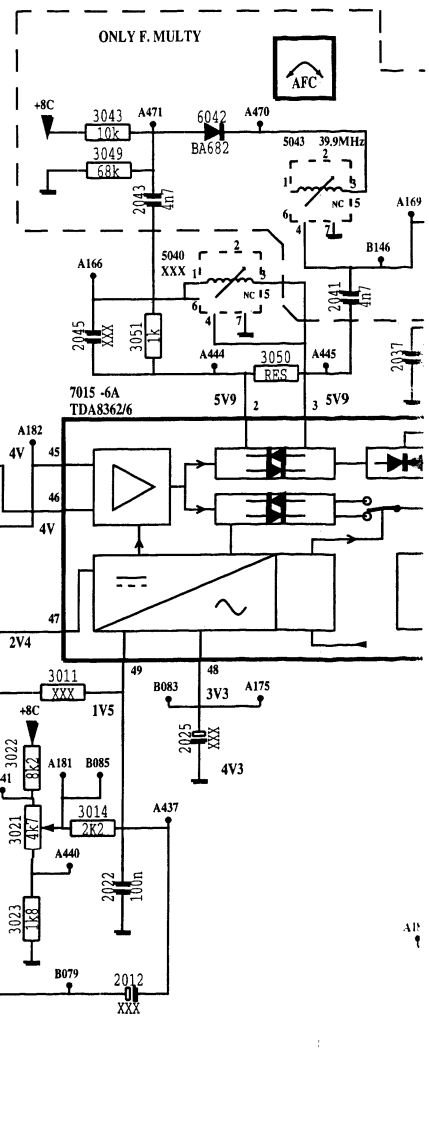
A7H.1\_A5.cdr  
121197



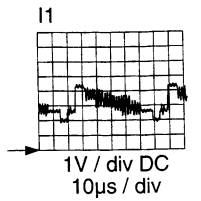
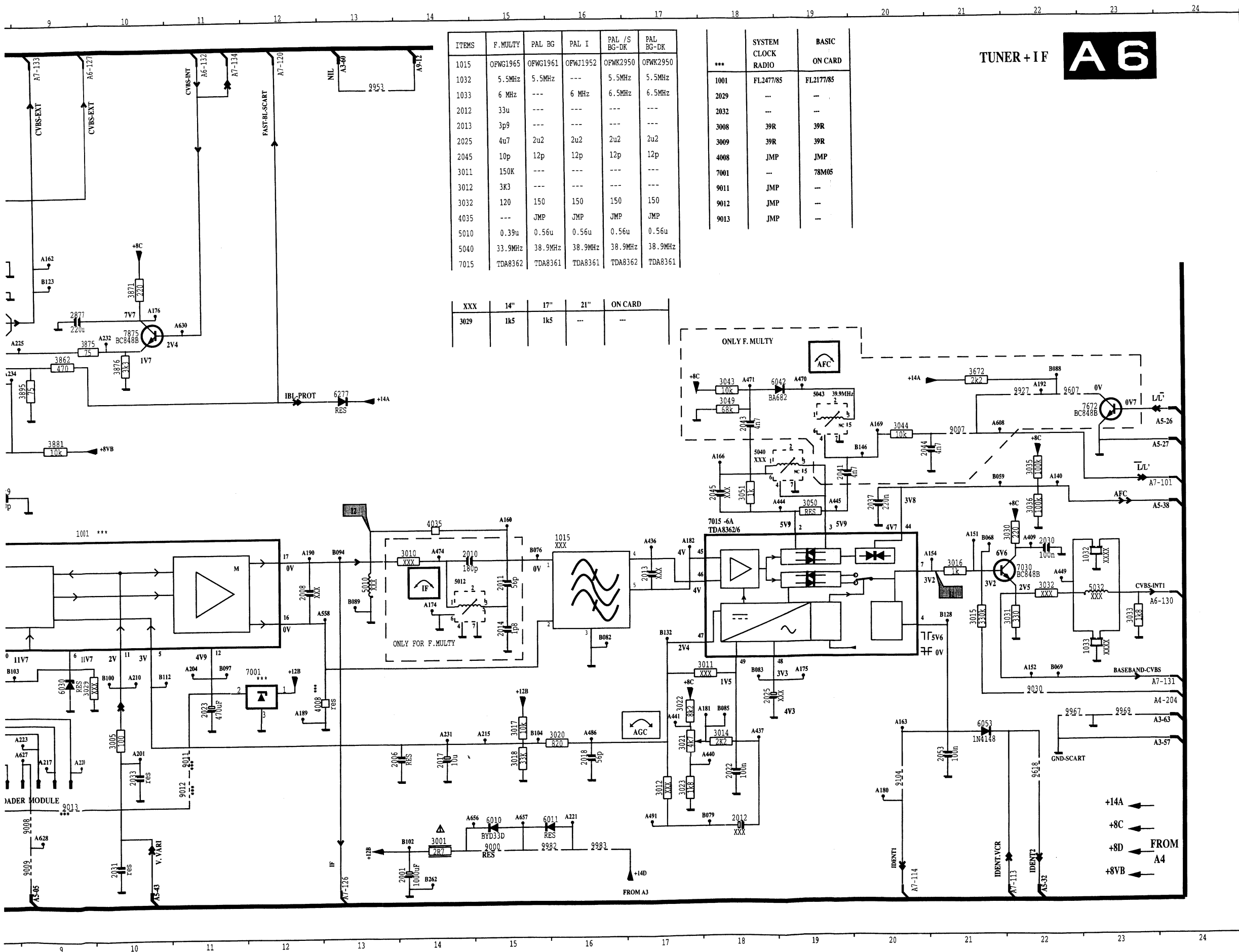
ITEMS	F. MULTY	PAL BG	PAL I	PAL /S BG-DK	PAL BG-DK
1015	OFWG1965	OFWG1961	OFWG1952	OFWG2950	OFWG2950
1032	5.5MHz	5.5MHz	---	5.5MHz	5.5MHz
1033	6 MHz	---	6 MHz	6.5MHz	6.5MHz
2012	33u	---	---	---	---
2013	3p9	---	---	---	---
2025	4u7	2u2	2u2	2u2	2u2
2045	10p	12p	12p	12p	12p
3011	150K	---	---	---	---
3012	3K3	---	---	---	---
3032	120	150	150	150	150
4035	---	JMP	JMP	JMP	JMP
5010	0.39u	0.56u	0.56u	0.56u	0.56u
5040	33.9MHz	38.9MHz	38.9MHz	38.9MHz	38.9MHz
7015	TDA8362	TDA8361	TDA8361	TDA8362	TDA8361

***	SYSTEM CLOCK RADIO	BASIC ON CARD
1001	FL2477/85	FL2177/85
2029	---	---
2032	---	---
3008	39R	39R
3009	39R	39R
4008	JMP	JMP
7001	---	78M05
9011	JMP	---
9012	JMP	---
9013	JMP	---

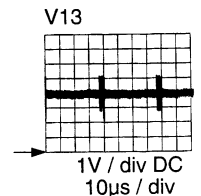
XXX	14"	17"	21"	ON CARD
3029	1k5	1k5	---	---







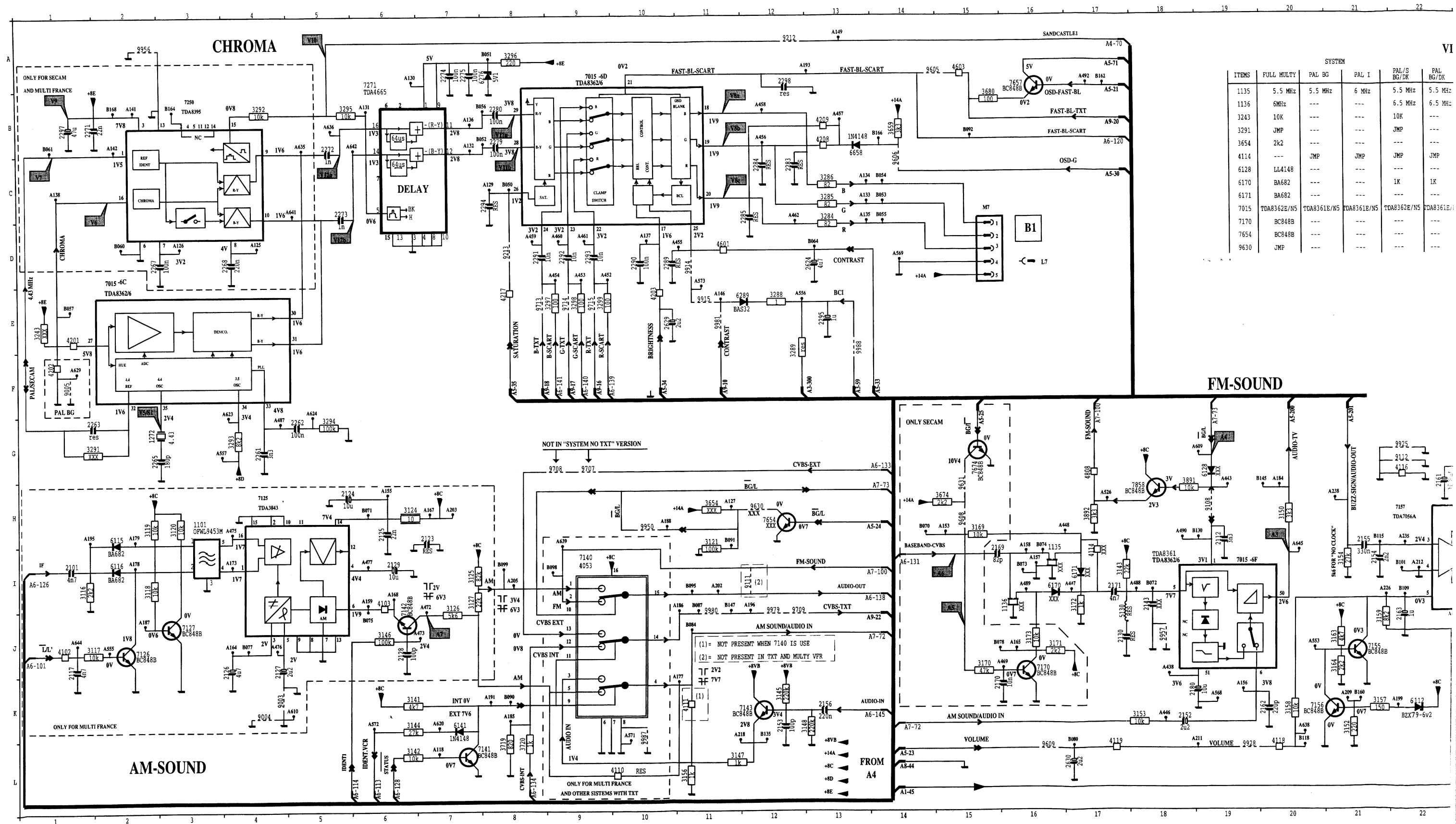
12 V<sub>pp</sub> 1.2V

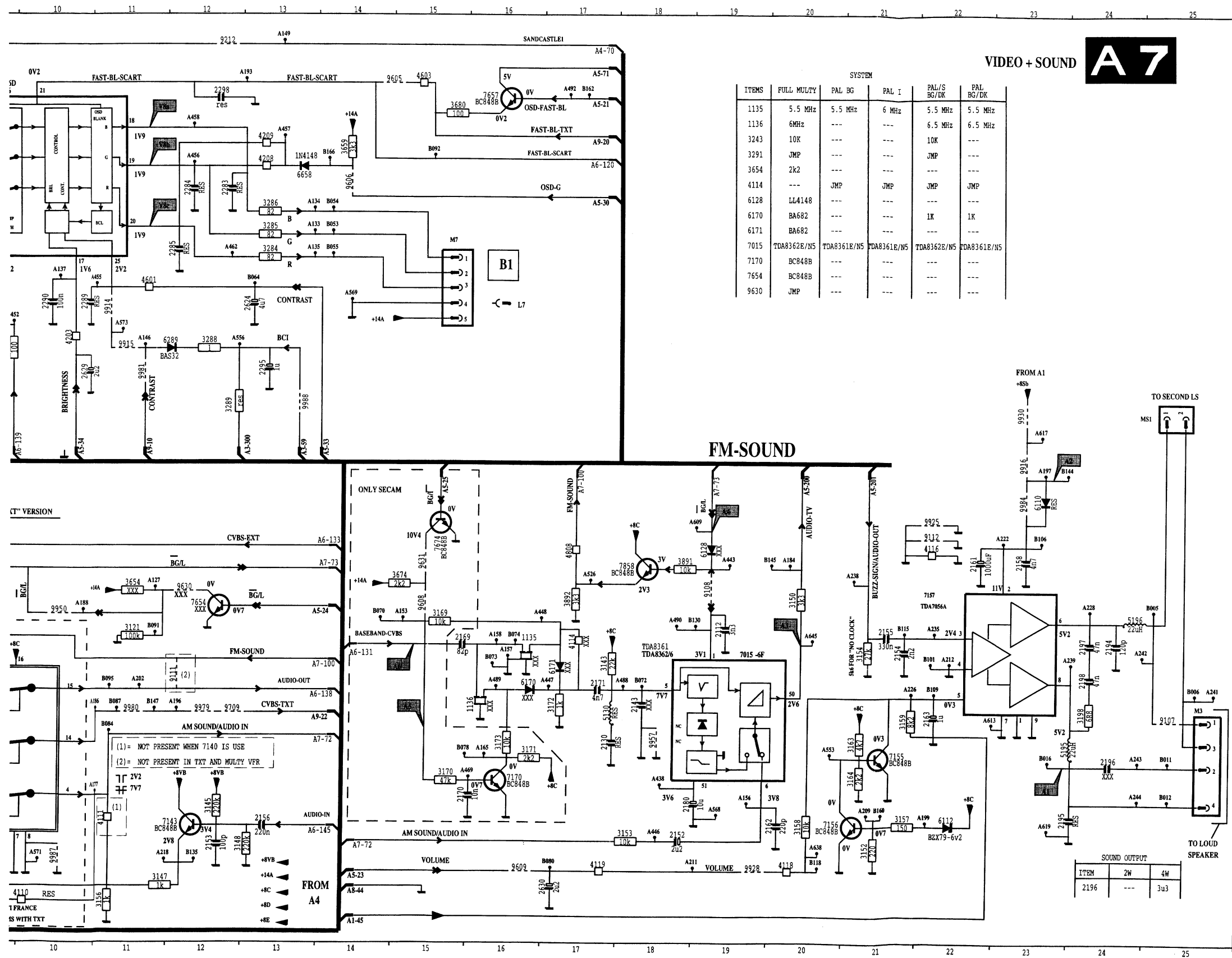


V14 no signal

$$\rightarrow = 0V$$

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121197



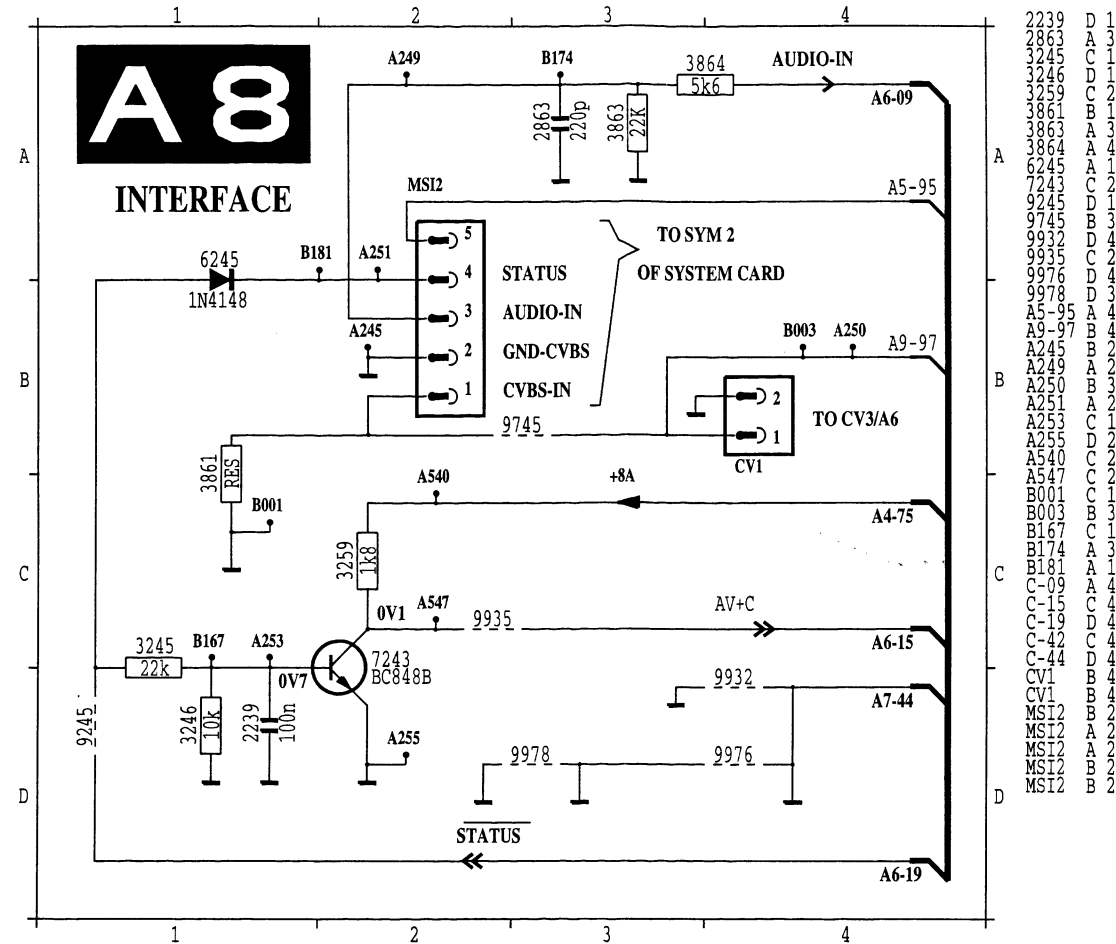
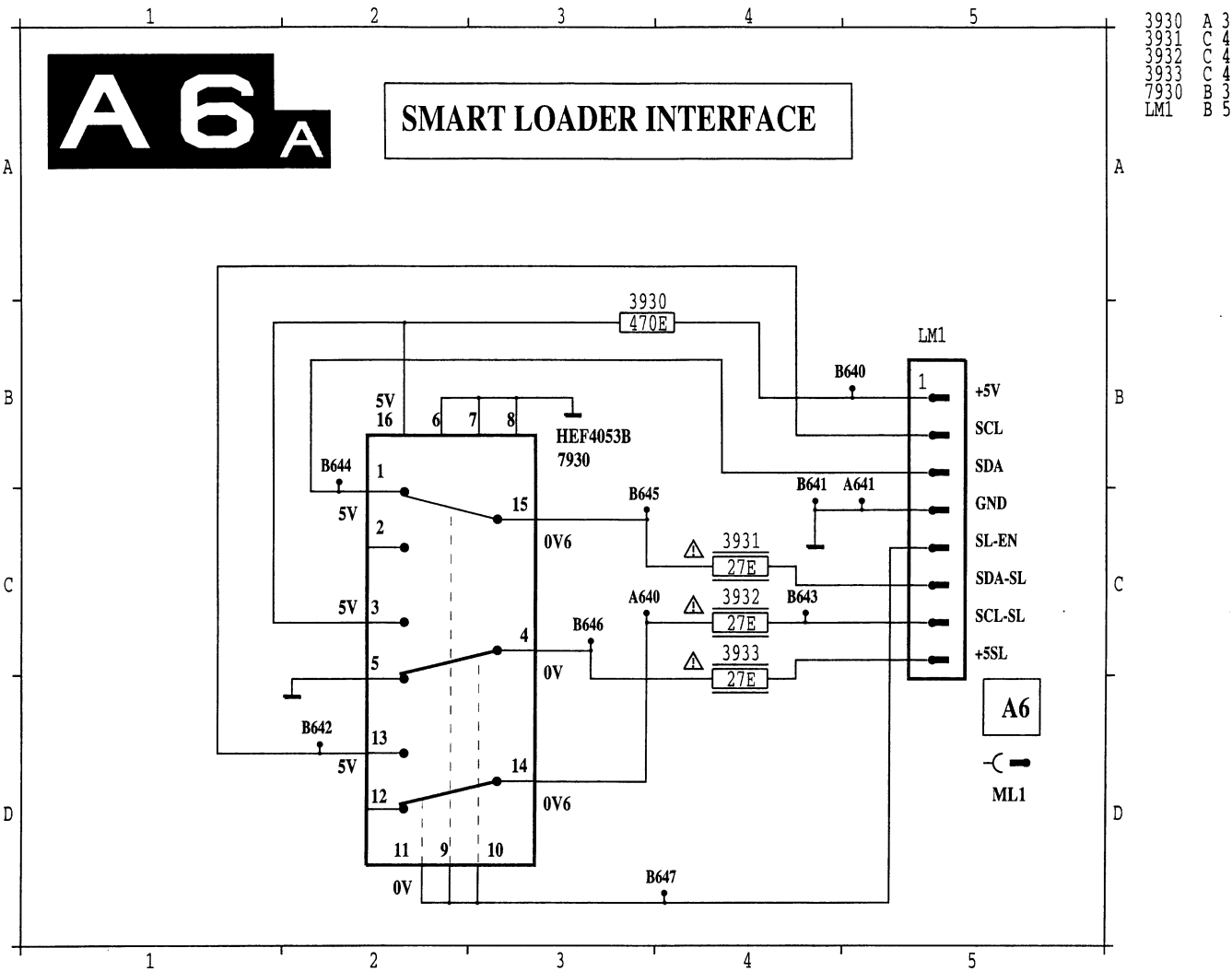


A	1101	H 3	4209	B13	A186	I11	B-22	J14
	1135	I16	4217	B 8	A187	J 2	B-23	L14
	1136	I16	4601	D11	A188	H10	B-24	L14
	1172	G 2	4603	A15	A189	K 3	B-25	F15
	2101	O 1	4808	G17	A193	A13	B-30	C18
	2112	H19	5130	J17	A195	H 2	B-33	F14
	2117	J 7	5195	J21	A196	H11	B-34	G10
	2123	H 5	5198	H24	A197	H11	B-35	G 8
	2124	H 6	6112	K22	A202	I11	B-45	L14
	2125	H 5	6115	H 2	A201	H 9	B-59	F13
B	2126	J 4	6118	H 2	A205	I 9	B-71	A18
	2127	J 4	6118	H 2	A205	I 9	B-71	A18
	2128	J 6	6128	G19	A209	K21	B-200	F20
	2129	I 6	6141	K 7	A211	L19	B-201	F21
	2130	J17	6170	I16	A212	L22	B-300	F12
	2143	I18	6171	I17	A218	K11	M3	J25
	2152	K18	6276	A 8	A222	G23	M3	J25
	2153	K12	6289	E12	A226	L21	M3	J25
	2154	I21	6598	C13	A228	H24	M3	J25
	2155	I21	7015	A 9	A235	H22	M7	C12
C	2156	K13	7015	I19	A238	H21	M7	D15
	2158	H23	7015	D 2	A239	I24	M7	D15
	2161	H22	7125	H 4	A241	I25	M7	D15
	2162	K20	7128	H 2	A242	I24	M7	D15
	2163	J22	7127	J 3	A243	J24	M7	D15
	2169	I15	7140	I 9	A244	K24	M7	D15
	2170	K15	7141	J 6	A438	J17	MS1	F25
	2171	I17	7142	J 6	A4	H19		
	2180	K18	7143	K12	A446	K18		
	2194	I24	7155	J21	A447	K18		
D	2195	K24	7156	K20	A448	H16		
	2196	J24	7159	H22	A449	D 9		
	2197	I24	7170	J16	A453	D 9		
	2198	I24	7250	B 3	A454	D 9		
	2261	G 4	7654	H12	A458	B12		
	2262	G 4	7654	H12	A458	B12		
	2263	G 1	7657	A16	A457	B13		
	2264	D 4	7674	G15	A458	B12		
	2265	D 4	7674	G15	A458	B12		
	2266	D 4	7674	G15	A458	B12		
E	2268	D 4	8003	K 4	A460	D 9		
	2271	B 2	8004	K 4	A461	D 9		
	2272	B 2	9005	F 6	A462	C12		
	2273	B 2	9005	F 6	A462	C12		
	2274	A 7	9108	H19	A472	J 7		
	2275	A 7	9111	I12	A473	J 7		
	2276	A 7	9112	G22	A472	H 4		
	2280	C12	9213	D 8	A477	H 4		
	2284	C12	9605	A14	A487	G 4		
	2288	D10	9606	H18	A488	H19		
F	2290	D10	9609	L16	A490	H18		
	2291	D 8	9630	H12	A491	A12		
	2292	D 8	9630	H12	A491	A12		
	2293	D 8	9707	G 9	A553	I20		
	2294	C 8	9708	G 9	A555	J 2		
	2295	E11	9709	J19	A556	I25		
	2296	E11	9717	E14	A557	I25		
	2298	A12	9714	E 9	A568	K19		
	2304	E10	9715	E 9	A569	D14		
	2305	E10	9914	D11	A571	K10		
G	3110	H 2	9928	H11	A572	G 2		
	3111	J 1	9916	F23	A573	D11		
	3112	J 1	9925	G22	A609	G19		
	3113	H 2	9928	H11	A610	K23		
	3114	H 2	9919	H 2	A611	C 3		
	3120	H 3	9950	H10	A617	F 5		
	3121	H11	9955	A 4	A619	K24		
	3122	H 1	9955	J12	A621	F 5		
	3127	K 7	9979	F 9	A622	F 5		
	3128	K 7	9980	J11	A624	F 5		
H	3141	K 7	9981	E11	A625	J20		
	3142	L 6	9981	E11	A625	J20		
	3142	L 6	9987	K10	A639	K10		
	3143	I17	9988	E11	A644	J 1		
	3144	F 5	A4	70	A141	A650	I20	
	3145	K16	A6	13	L 5	B006	I25	
	3146	J 6	A6	13	L 5	B006	I25	
	3147	K16	A6	114	L 5	B011	J25	
	3148	K16	A6	120	B17	B012	K25	
	3149	H20	A6	120	B17	B012	K25	
I	3152	K21	A6	128	L 6	B050	C 8	
	3153	K18	A6	31	I14	B051	A 8	
	3154	K18	A6	31	I14	B051	A 8	
	3155	K18	A6	31	I14	B051	A 8	
	3156	K18	A6	31	I14	B051	A 8	
	3157	K21	A6	138	J14	B054	C14	
	3158	K20	A6	138	J14	B054	C14	
	3159	K20	A6	138	J14	B054	C14	
	3160	K20	A6	138	J14	B054	C14	
	3161	K20	A6	138	J14	B054	C14	
J	3162	K21	A6	141	F 9	B057	E 8	
	3163	J21	A6	145	K13	B057	E 8	
	3164	J21	A6	145	K13	B057	E 8	
	3165	J21	A6	145	K13	B057	E 8	
	3166	J21	A6	145	K13	B057	E 8	
	3167	J21	A6	145	K13	B057	E 8	
	3168	J21	A6	145	K13	B057	E 8	
	3169	J21	A6	145	K13	B057	E 8	
	3170	J21	A6	145	K13	B057	E 8	
	3171	J16	A7	72	K13	B070	H14	
K	3172	J16	A7	72	K13	B071	H 6	
	3173	J16	A7	72	K13	B071	H 6	
	3174	J16	A7	72	K13	B071	H 6	
	3175	J16	A7	72	K13	B071	H 6	
	3176	J16	A7	72	K13	B071	H 6	
	3177	J16	A7	72	K13	B071	H 6	
	3178	J16	A7	72	K13	B071	H 6	
	3179	J16	A7	72	K13	B071	H 6	
	3180	J16	A7	72	K13	B071	H 6	
	3181	J16	A7	72	K13	B071	H 6	
L	4201	E 1	A178	I 2	B177	G 9		
	4202	F 1	A178	I 2	B177	G 9		
	4203	F 1	A178	I 2	B177	G 9		
	4204	F 1	A178	I 2	B177	G 9		
	4205	F 1	A178	I 2	B177	G 9		
	4206	F 1	A178	I 2	B177	G 9		
	4207	F 1	A178	I 2	B177	G 9		
	4208	F 1	A178	I 2	B177	G 9		
	4209	F 1	A178	I 2	B177	G 9		
	4210	F 1	A178	I 2	B177	G 9		

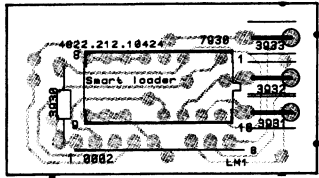
Smart loader interface / Smart lader /  
Chargeur à mémoire

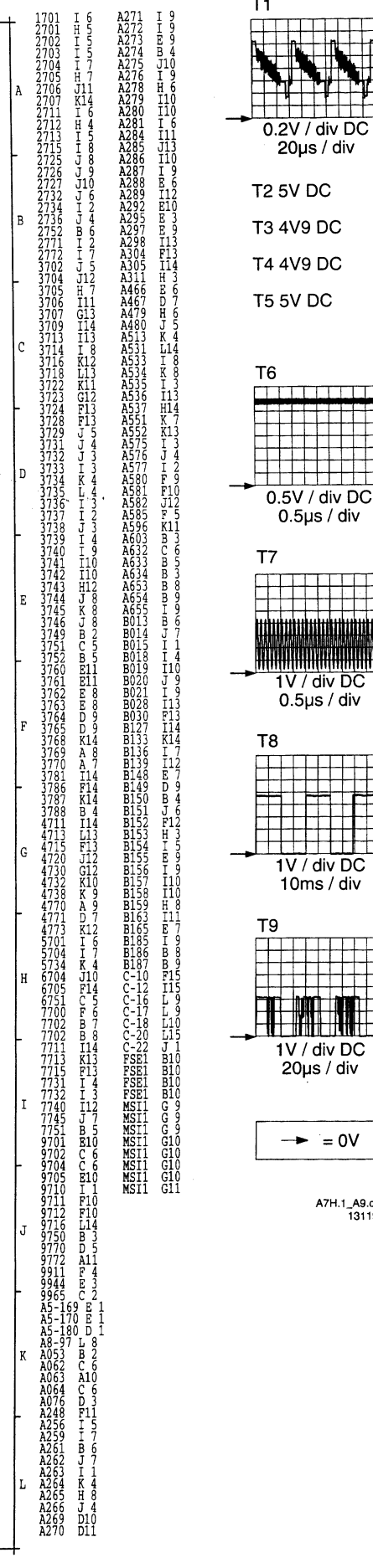
Chassis A7H.1 15

Interface / Interface / SVSH verbindung

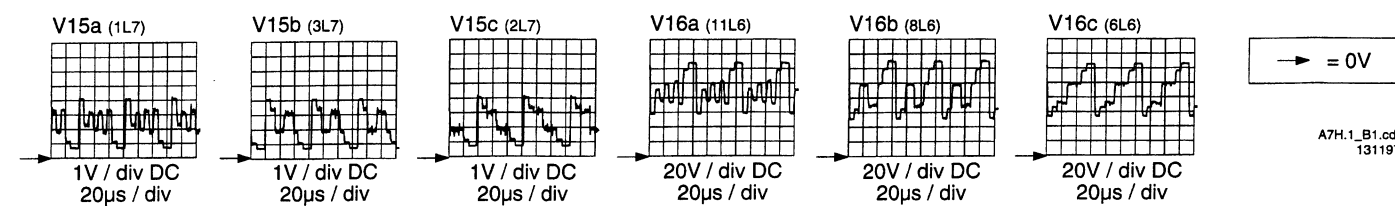
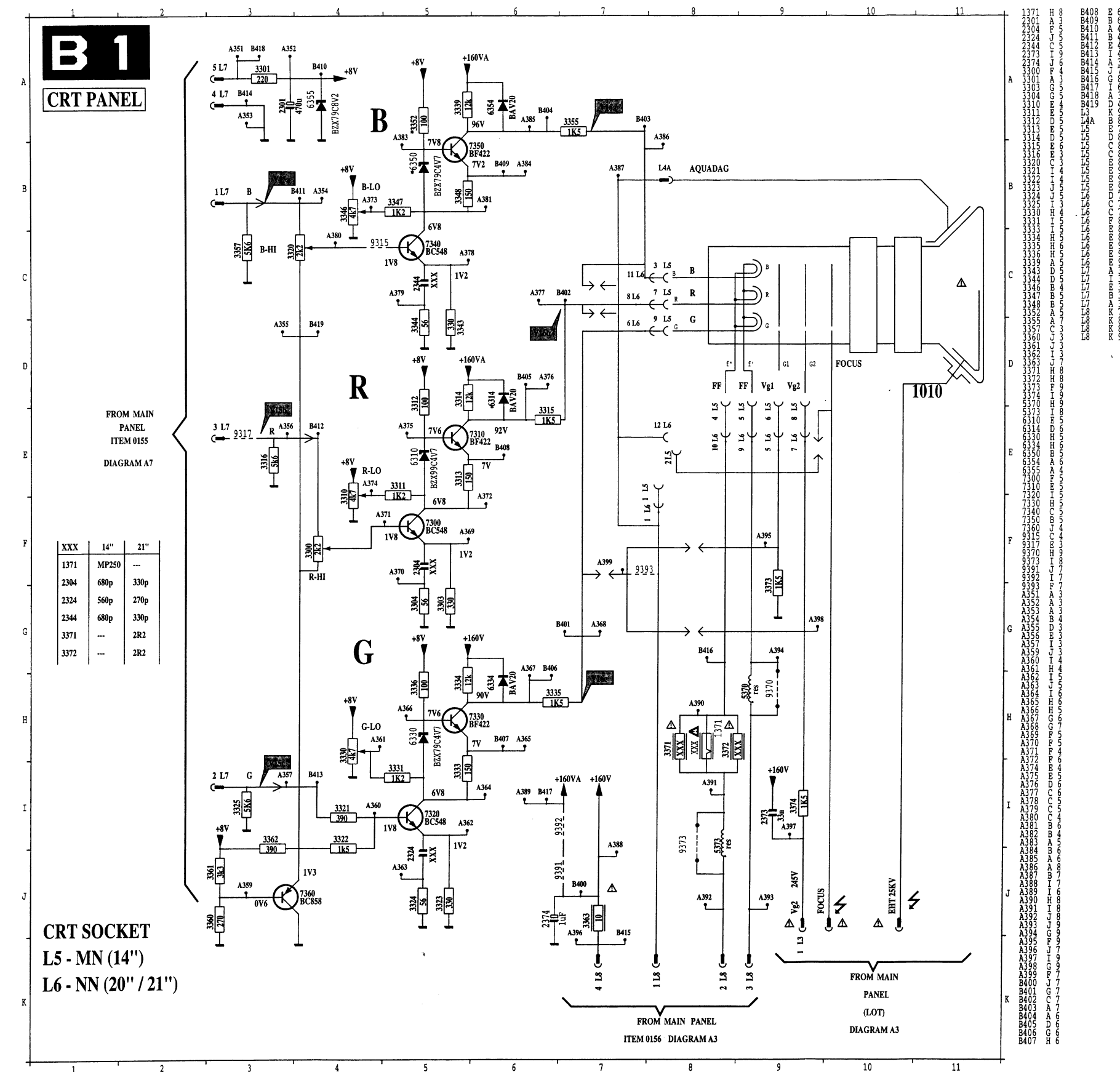


Smart loader



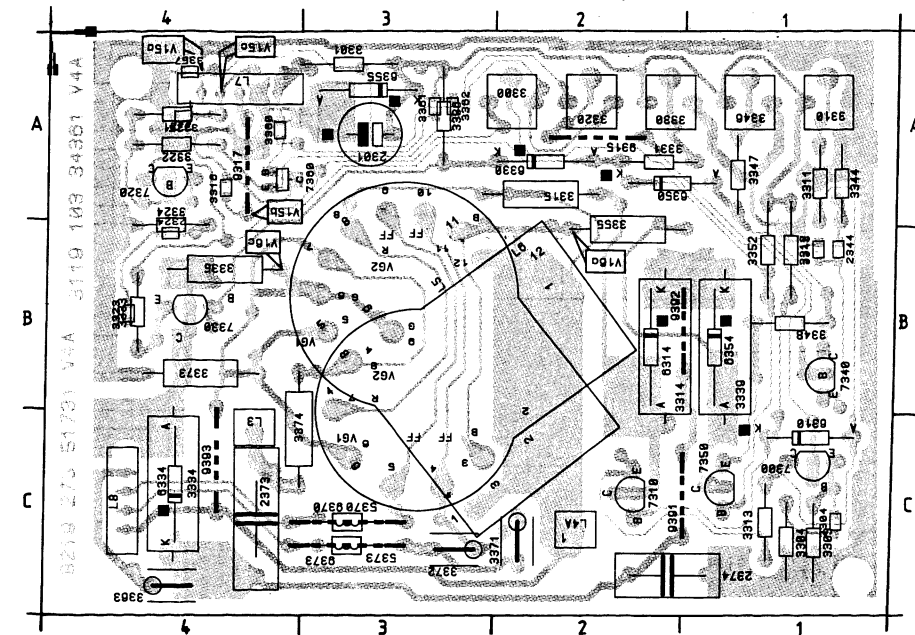




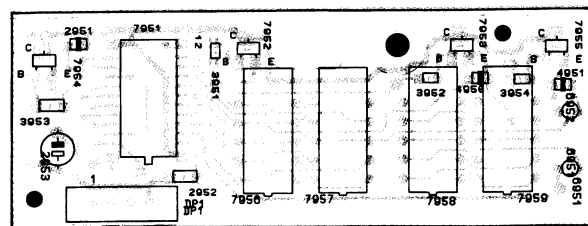
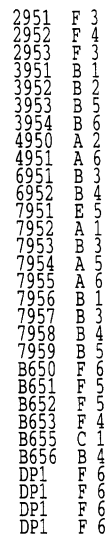


2301 A3	3311 A1	3325 A4*	3348 B1	3374 C3	7310 C1	9392 B1
2304 C1*	3312 B1	3330 A1	3352 B1	5370 C3	7320 A4	9393 C4
2324 B4*	3313 C1	3331 A1	3355 B7	5373 C3	7330 B4	
2344 B1*	3314 B1	3333 B4	3357 A4*	6310 C1	7340 B1	L3 C3
2373 C3	3315 A2	3334 C4	3360 A3*	6314 B1	7350 C1	L4A C2
2374 C1	3316 A4*	3335 B4	3361 A2*	6330 A2	7360 A3*	L5 C3
3300 A2	3320 A2	3336 A2	3362 A2*	6334 C4	9315 A2	L6 B2
3301 A3	3321 A4	3339 B1	3363 C4	6350 A1	9317 A3	L7 A4
3303 C1	3322 A4	3343 B1*	3371 C2	6354 B1	9370 C3	L8 C4
3304 C1	3323 B4*	3346 A1	3372 C2	6355 A3	9373 C3	
3310 A1	3324 B4	3347 A1	3373 B4	7300 C1	9391 C1	

\*=Chip component



## 18

[illegible]

## 8. Electrical adjustments

### 1. Adjustments on the main panel (Fig. 8.1)

#### 1.1 Horizontal centring

Is adjusted with potentiometer **R3354**.

#### 1.2 Picture height

Is adjusted with potentiometer **R3407**.

#### 1.3 Focusing

Is adjusted with the focusing potentiometer in the line output transformer.

#### 1.4 IF filter (only for sets with SECAM LL' reception possibility)

Connect a signal generator (e.g. PM5326) via a capacitor of 5p6 to pin 17 of the tuner and adjust the frequency for 40.4 MHz.

Connect an oscilloscope to pin 1 of filter 1015.

Switch on the set and select system Europe (BG/L is "low" for BGIDK reception).

Adjust **L5012** for a minimum amplitude.

#### 1.5 AFC

##### a. For sets with SECAM LL' reception possibility:

Connect a signal generator (e.g. PM5326) as indicated in point 1.6. Connect a voltmeter to pin 44 of IC7015/6A.

Adjust the frequency for 33.9 MHz and select system France (L/L' is "high" for L' reception). Adjust **L5040** for 3V5 (DC).

Next adjust the frequency for 38.9 MHz and select system Europe (L/L' is "low" for BGIDK reception). Adjust **L5043** for 3V5 (DC).

##### b. For sets without SECAM LL' reception possibility:

Connect a signal generator (e.g. PM5326) as indicated above and adjust the frequency for 38.9 MHz (for PAL I at 39.5 MHz). Connect a voltmeter to pin 44 of IC7015/6A. Adjust **L5040** for 3V5 (DC).

#### 1.6 RF AGC

If the picture of a strong local transmitter is reproduced distorted, adjust potentiometer **R3021** until the picture is undistorted.

Or: Connect a pattern generator (e.g. PM5518) to the aerial input with RF signal amplitude = 1 mV.  
Connect a multimeter (DC) at pin 5 of tuner.

Adjust **R3021** so that voltage at pin 5 of tuner is  $7V5 \pm 0V5$  (DC).

### 2. Adjustments on the CRT panel (Fig. 8.1)

#### 2.1 Vg2 cut-off points of picture tube

Apply a pattern generator (e.g. PM5518) and set it to a white raster pattern.

Adjust contrast and Vg2 at minimum (Vg2 with potentiometer in line output transformer to the left).

Adjust brightness until the DC voltage across potentiometer 3320 is 0V.

Adjust **R3346** (B), **R3330** (G) and **R3310** (R) for a level of 115V on the collectors of transistors 7350, 7310 and 7330.

Adjust **Vg2** potentiometer until the gun that first emits light is just no longer visible. Adjust the two other guns with the respective controls (3346, 3330 or 3310 or for until just no light will be visible.

#### 2.2 Grey scale (white D)

Apply a test pattern signal and adjust the set for normal operation. Allow the set to warm up for about 10 minutes. Adjust **R3300** and **R3320** (R3263 and R3273 for 20") until the desired grey scale has been obtained.

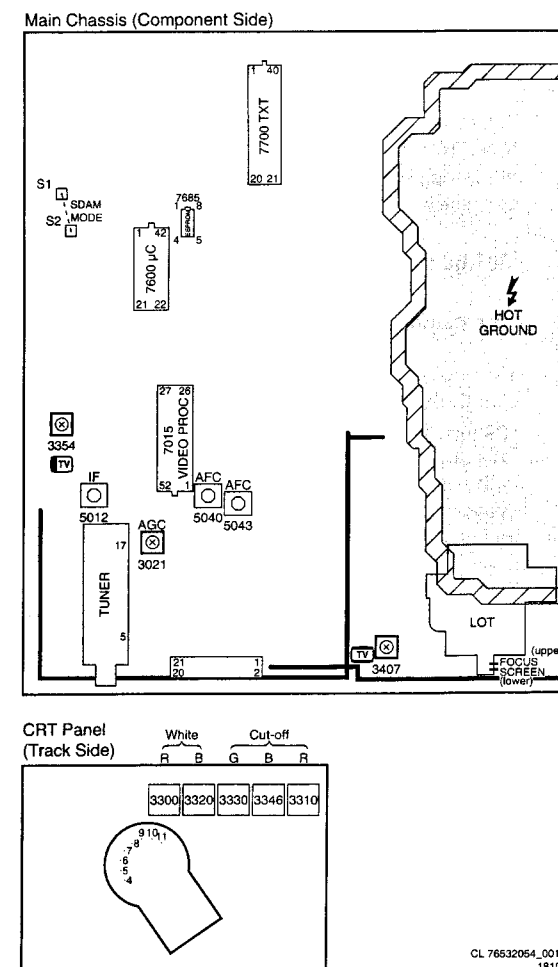


Fig. 8.1

## 9. Circuit description

For the description of the audio and video processing circuits see the description in the AA5 AA manual. For the description of the clock panel (Diagram E1), the radio module (Diagram E2) the TXT part (Diagram A9) and the smart loader panel (Diagram A6a), see AA5H.1 AA Chassis manual.

### 1. Description of the power supply and the deflection part

In the A7H.1 AA chassis all power circuits are mounted on the main carrier panel.

The power supply can be divided in 2 parts:

- External power supply (not switched off by power switch).
- Main power supply (switched off by power switch).

- External power supply (with transformer item 5502). This power supply is equal to the switched mode power supply as already introduced in the AA5H.1 chassis. Supply functions of the "Extra power supply" in AA5H.1 chassis are in A7H.1 taken over by the External power supply.

- Main power supply (with transformer item 5500) and deflection.

This power supply and deflection are the same ones as used in L6.1 and L6.2 chassis.

**Warning:** For this power supply is valid that the +96V supply for the line output stage is not mains isolated. And therefore the line output stage and horizontal deflection coil connections on the CRT are also not mains isolated.

**Remark:** With this supply single isolated picture tubes can be used.

For a description of the main power supply and belonging deflection circuit see below.

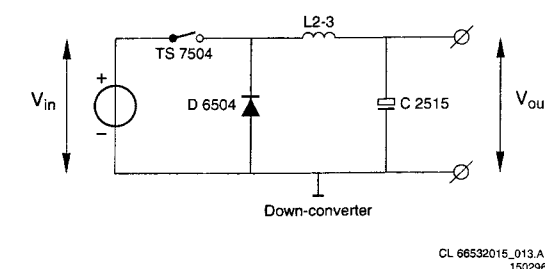


Fig. 9.1

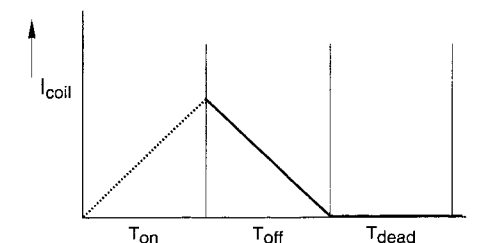
#### 1.1 Principle of the down-converter (Fig 9.1)

The main power-supply is a self-oscillating down converter with an auxiliary winding to help the FET to switch.

When switch TS7504 is closed, the voltage on L2-3 is  $V_{in} - V_{out}$ . During this time, energy is stored in the coil and energy is delivered to the load. When switch TS7504 opens, the energy stored in the coil will be stored in the output capacitor (C2515). This is due to the fact that the current through the coil has to decrease linear. When the switch is open the current is floating through D6504, L2-3 and C2515. By controlling the duty-cycle of the switch, the output voltage can be regulated.

#### 1.2 Start-up (see diagram A1)

When the switch TS7504 is closed, the input voltage is placed over winding 2-3 of transformer 5500, which acts as coil L2-3 in Fig 8.1. Via resistors R3513, R3518 and R3512 the switch is turned on for the first time. Zener diode D6502 prevents that the Ugs of the FET becomes higher than 15V. When the input voltage is on winding 2-3, there is also a voltage on winding 1-2. Via winding 1-2 the correct switching voltage is obtained. The DC-part of this voltage is blocked by capacitor C2503. Diode D6510 acts as a protection in start-up and in short-circuit situations. During start-up the output capacitor C2515 is empty. It takes a relative long time to charge the gate to a voltage high enough to switch on the FET. This is due to the fact the diode D6510 is conducting. When this diode is conducting, the current that would normally flow into the gate of the fet to switch on the FET, is now flowing into C2515. In this way a smooth start-up is guaranteed.



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Fig. 9.2

#### 1.3 General way of working (Fig 9.2)

The state of the power-supply can be divided into three areas (see Fig. 9.2):

- **T-on;** In this state the FET is conducting and energy is stored in the coil and in the output capacitor.
- **T-off;** In this state the fet is non conducting and the energy stored in the coil is fed to the output capacitor.
- **Tdead;** Fet is out of conduction and there is no energy in the coil.

# Circuit description

**T-on;** In the T-on state, switch TS7504 is switched on. When the switch is on the voltage over resistors R3514-R3515 is a direct measure for the current through winding 2-3. This is a negative voltage. When this voltage becomes below a certain level, TS7501 starts conducting and will switch off the fet. In this way it is prevented that the coil can go into saturation. This could be the case when the output voltage is very low. (long on time of the FET). When the output-voltage becomes too high during T-on the FET will be switched off. (see Output-voltage regulation)

**T-off;** Due to the stored energy a current will start to flow through D6504, C2515 and winding 2-3. Due to the fact that the current is flowing through this circuit, a voltage with reverse polarity is on winding 1-2. In this way the fet remains off until the current through winding 2-3 reaches zero. Now a new cycle will start. The fet will be switched on and all starts over again.

**T-dead;** If the output voltage is too high (for example in a low load situation) the FET remains off till the output-voltage is not to high anymore.

## 1.4 Output voltage regulation

This is done by the circuit D6501, R3509, TS7502, R3505, R3507, R3510. Transistor TS7502 can only conduct when the voltage on the base is 0V7 lower than the voltage the voltage on the emitter. This means that the voltage drop over resistors R3505 and R3507 should be 5V6 (zenerdiode) + 0V7(base-emitter). This is reached when the output voltage exceeds the 100V. Now transistor TS7502 starts conducting, which brings transistor TS7501 in conduction. As a consequence the gate voltage of the fet becomes very low and the fet stops conducting. As long as the output voltage is too high the fet stays out of conduction.

## 2. Protections

### 2.1 Overvoltage protection

A disadvantage of a down converter is that if the switch becomes a short-circuit, the output voltage will increase to the input voltage. This could damage circuits. In this power-supply there is a protection to prevent this. If the output voltage becomes higher than 130V, zener diode D6514 starts to conduct. The Vin will be short circuited. This will blown the main fuse 1501 and protect in this way all the other circuits.

### 2.2 Short-circuit and start-up protection

The short-circuit protection works the same as the start-up protection. If the output-voltage is very low in case of a start-up or a short-circuit condition, The gate will be charged very slowly due to the fact that zenerdiode D6510 is conducting. So the current is not only charging the gate but is also flowing into the output capacitor. In this way it takes a few milliseconds to switch on the fet. Diode D6510 takes also care that the fet never remains in his power consuming (linear) area. If the output voltage is very low, it also takes a large time before the current through winding 2-3 reaches zero. The power supplied to the circuit is in this way very low and protects in this way the circuit.

### 2.3 Other output voltages

The output voltages +8Sb,+14V +9S and +5S and +5G are made by winding 5-6. During the time that the FET TS7504 is not conducting, energy is transformed to this winding (flyback principle) and the voltages mentioned above are created. From the +9S, the +5S voltage is derived. This voltage is stabilized by transistors TS7505, TS7500 and zenerdiode D6500. D6500 is the reference voltage and TS7505 is delivering the current. When zenerdiode D6500 starts conducting, the voltage over resistor R3502 becomes high and a POR signal is created.

## 3. Degaussing

R3516 is a dual PTC (2 PTC's in one housing). After switching "on" the set, the PTC is cold, so low ohmic. This makes the degaussing current high. After degaussing the PTC is heated, so high ohmic. This makes the degaussing current low. After degaussing the PTC remains heated by the mains.

## 4. Line-circuit (Diagram A3)

The primary side of the line-circuit and the deflection coil are connected to the hot earth. The driver-circuit contains an opto-coupler to create isolation between the low-signal parts and the mains. The optocoupler is driven by pin 37 of IC7015-6E via transistor TS7103.

When TS7103 is not conducting,(the LED of the opto-coupler is also out of conduction) TS7421 is also not conducting. In this way TS7422 will conduct and the 96V is placed over winding 2-1 of the LOT. A voltage over winding 2-1 of the LOT will cause a voltage over the windings 8-10, 6-10 and 9-10. Now energy will be transformed from the primary to the secondary-side and charge capacitors C2424 and C2425.

# Circuit description

C2430 will be charged to the difference of the +40D and +14D (=26V) when TS7422 is conducting. When TS7422 stops conducting, the voltage of pin 8 of the LOT will become very negative. This forces C2430 to be charged to 26V plus the absolute value of pin 8. When TS7422 starts conducting again the voltage of pin 8 of the LOT will increase and so the voltage on the anode of D6422. In this way the 160V is created. This means that during the off-time of TS7422, C2430 is charged and during the on-time of TS7422, the energy in C2430 is given to C2426.

When transistor TS7103 conducts, the LED of the opto-coupler will be activated. This causes the transistor of the opto-coupler to conduct, which drives TS7421 in conduction. This brings TS7422 out of conduction. Due to this construction, this circuit is protected against missing line-drive pulses. When a line-drive pulse is missed, the line-transistor stays out of conduction, due to the fact that the diode of the opto-coupler is forced into conduction by TS7103. In this way nothing can be damaged when there is no line-drive. Winding 4-3 is an extra winding to help TS7422 to switch.

On the secondary-side of the LOT there is a circuit consisting of TS7423, R3422, R3433, R3434, C2431 and C2432. This circuit creates a pulse when TS7422 switches off. This pulse indicates that horizontal flyback takes place. This information is fed to IC7015-6E to blank the picture.

### 4.1 Stand-by

The standby signal from the mC is low in case of stand-by. Now TS7103 is brought into conduction by R3112. As mentioned before this will switch off the line-output stage completely.

## 5. Deflection

### 5.1 Horizontal deflection

The voltage over capacitor C2422 is the same as the voltage over C2515 (96V, see Diagram A1). When TS7422 is conducting this voltage is placed over the horizontal deflection coil. This causes a linear increasing current through this coil. In this way deflection is created. When TS7422 switches of flyback takes place and it starts all over again. L5424 is used for linearity correction.

### 5.2 Vertical deflection

Vertical deflection is based on a balance amplifier. Or TS7401 or TS7402 is conducting. This depends on the signal V-drive. If V-drive is high TS7401 conducts and the voltage of C2401 is placed over the deflection coil. Now the picture is written. When V-drive is low, TS7402 conducts and the +40V supply voltage minus the voltage over C2401 is placed over the deflection coil. Flyback takes now place. In this way deflection is generated. R3407 is used to adjust the vertical shift. With this resistor the level of the signal VFB is adjusted. R3402 and C2404 are used to damp oscillation of the deflection coil with his parasitic capacitance. The signal NIL from the mC is used to create a non-interfaced mode. This is done by creating a small DC current through the deflection coil.

PHILIPS Hotel TV

This product has been especially designed by Philips for institutional applications. These istruction for use are a quick reference for installers. A complete instruction for use is also available. For more information ask the nearest Philips branch office.

TV INSTALLATION



The installation requires the remote control RC 8611.

Place the TV on a solid base.

Leave at least 5 cm around each side of the TV for ventilation.

To prevent any faults and unsafe situations, do not place any objects on top of the sets.

The TV can only operate at a mains voltage of 220/240 V-, 50 Hz.

- Select the last TV channel available by pressing TV — or +.
- Press the  button on the local keyboard than press the  button on the remote control for more than 4 seconds.
- ▷ Installation menu appears.  
Use the cursor up and down to navigate into the menu lines. Use the cursor left and right to select the menu options. Use the digit button to insert numbers.

MENU

- **Language.**  
To select the menu and the On Screen Display language: [ENGLISH - FRANCAIS - DEUTSCH].
- **Configuration.**  
Attention : The configuration of the TV is set by Philips, changing the configuration may change the availability of the menu options and the featuring of the TV.  
**TV system:** To choose the TV system [SINGLE - UHF - MULTI F].  
**Teletext:** To enable the teletext [YES - NO].  
**Clock:** To enable the clock [YES - NO].  
**Radio:** To select the radio type [INT (internal) - EXT (external) - NONE].  
**Interface system:** To enable the interface of the system [YES - NO].
- **Number of programs**  
**TV:** To assign the max. number of TV programs [1-99].  
**INFO:** To assign the max. number of info programs [1-99].  
**RADIO:** To assign the max. number of radio programs [1-99].  
Note: Radio available only if Configuration-Radio set to INT or EXT.  
**PAY TV:** To assign the max. number of PAY TV programs [1-99].  
Note: PAY TV available only if Configuration-Interface system set to YES.  
The total max. number of programs available is 120.
- **TV installation**  
**System:** To select the TV system: [EUROPE, FRANCE,UK].  
Note: System appears only if "MULTI F" is selected in the Configuration menu.  
**Search:** To search for the video channels or to input the frequency digit.  
**Fine tune:** To adjust the tuning when a video channel is not well tuned.  
**Programme:** To assign a video channel to a TV or INFO or PAY TV program.  
**More:** More program options
  - **Protection:** To set the program protection [YES - NO].
  - **Picture Mute:** To blank the picture of a video program [YES - NO].
  - **Sound Mute:** To mute the sound of a video program [YES - NO].  
**Store:** To store the selections.
- **Radio install**  
Note: Available only if configuration radio set to INT or EXT.  
**Search:** To search for the radio channels or to input the frequency digits.  
**Programme:** To assign a radio channel to a radio program.

**Protection:** To set the program protection [YES - NO].

**Store:** To store the selections.

Parameter setting

Initial setting

**Switch on channel:** To select the switch on program [TV - INFO].

**Switch on volume:** To set the switch on volume [00 - 63].

**Display standby:** To set the light intensity of the led display in standby mode [1-5].

**Display on:** To set the light intensity of the led display in TV on mode [1-5].

**Welcome message:** To display the welcome message [YES - NO].

To insert the message use the cursor up and down to select the character and the cursor left and right to navigate.

Picture setting

To set picture settings (low-normal-high) that can be recalled with the PICTURE button on the RC.

Block function

**Hotel mode:** To enable maximum volume, block local, free protected options [YES - NO].

**Maximum volume:** To set the max. volume limitation [00 - 63].


**Block local:** To lock the local controls of the TV.

**Free protected:** To free at once all the protected programs.

**Time setting:** To set the time of the clock.

**Time downloading:** To link the time of the clock to the teletext of the selected program (TV-INFO-PAY TV).

Tips

- **To quickly install the TV**  
Philips has designed also other tools for quick installation, like the SMART-LOADER or the ACI. For more information ask the nearest Philips branch office.
- **To clean the TV**  
Clean the TV using a slightly damp chamois leather.  
**Never use aggressive cleaning agents.**
- **Problems with no solution:**  
Switch your TV off and on again with the  button.  
**Never attempt to repair a defective TV set yourself.**  
Switch off the TV and call your dealer or TV-technician when nothing helps or when:
  - A white horizontal stripe appears across the whole screen.
  - The red lamp below the screen starts blinking when no buttons are pressed on the remote control.

Environmental information

Your TV contains material which can be recycled and reused. At end of life specialized companies can dismantle the discarded TV to concentrate the reusable materials and to minimize the ammount of materials to be disposed off.  
**Please find out about local regulations on disposal of your old TV set.**

*Televisions consume energy in the stand-by mode. Energy consumption contributes to air and water pollution. We advice you to switch off your TV overnight instead of leaving it on stand-by. You save energy and the picture tube is demagnetised which maintains good picture quality .*



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## Notes:

# 12. Spare parts list / Stükliste / Liste des pièces

Chassis A7H.1

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## Main carrier [A1,A3-A9]

### Various

▲	4822 276 12597	Mains switch
	4822 276 13307	Operating switch
		assy
▲	4822 265 30389	Con. 2P (0041)
▲	4822 265 40596	Con. 2P (0050)
▲	4822 265 30389	Con. 2P (0051)
▲	4822 265 20709	Con. 2P (0061)
	4822 264 40207	Con. 3P (0040)
	4822 264 40239	Con. 3P (0063)
	4822 290 40284	Con. 3P RFK1
	4822 267 41213	Con. 4P eco duo
	4822 267 40699	Con. 4P (PD1)
▲	4822 267 41208	Con. 4P (0045)
	4822 265 30378	Con. 4P (0048)
	4822 265 30899	Con. 5P (0053)
	4822 267 30546	Con. 6P
	4822 265 40252	Con. 7P RFK1
	4822 290 40295	Con. 7P (0049)
	4822 265 40818	Con. 8P (0056)
▲	4822 267 60243	Con. 21P Scart
	4822 492 71655	Spring fix. IC7157
	4822 492 11528	Spring fix. IC7401, IC7402
	4822 492 70871	Spring fix. IC7422
	4822 492 70871	Spring fix. IC7504
▲	4822 256 92053	Fuse holder (1501)
	4822 256 91918	LED holder
	4822 404 31451	Bracket fix. IR receiver
	4822 402 10524	Tuner bracket (extended)
	4822 404 31452	Tuner bracket
	4822 402 10178	Interface bracket (TV cap)
1001	4822 210 10715	Tuner FL2477/B5 PLL
1015	4822 242 70936	Filter 38.9MHz OFWJ1952M
1015▲	4822 242 72197	Filter 38.9MHz OFWK2950M
1015	4822 242 81388	Filter 38.9MHz OFWG1961M
1015	4822 242 81737	Filter 38.9MHz OFWG1965M
1032	4822 242 72211	Filter 5.5MHz (TPS)
1032	4822 242 81712	Filter 5.5MHz (TPWA04B)
1033	4822 153 30025	Filter 6MHz (TFS)
1033	4822 242 81301	Filter 6.5MHz (TPS)
1033	4822 242 81572	Filter 6MHz (TPS)
1101	4822 242 81423	Filter 38.9MHz OFWL9453M
1135	4822 242 70714	Filter 5.5MHz
1135	4822 242 71841	Filter 6.0MHz
1136▲	4822 242 10316	Filter 6.5MHz
1136	4822 242 71713	Filter 6.0MHz
1501▲	4822 070 33152	Fuse3.15A
1502▲	4822 252 51185	Fuse 630mA
1679	4822 242 10328	X-tal 8MHz
1685	4822 212 30842	IR receiver
1701	4822 242 81246	X-tal 27MHz

### II

2001	4822 124 40201	1000µF 20% 16V
2007▲	4822 126 12944	47nF 10% 50V
2008	5322 122 32967	5.6pF 10% 63V
2010	4822 126 10326	180pF 5% 63V
2011	5322 122 32661	56pF 5% 50V
2012	4822 124 42058	33µF 20% 50V
2013	5322 122 31944	3.9pF 5% 50V
2014	5322 126 10343	1.8pF 5% 63V
2015	4822 124 81029	100µF 20% 25V
2016▲	4822 126 10002	100nF 20% 25V
2017▲	4822 124 41579	10µF 20% 50V
2018	5322 122 32661	56pF 5% 50V
2022▲	4822 126 10002	100nF 20% 25V
2023	4822 124 80791	470µF 20% 16V
2025	4822 124 40763	2.2µF 100 V
2025	4822 124 40769	4.7µF 20% 100V
2030	4822 126 13482	470nF 80/20% 16V
2034▲	4822 126 12944	47nF 10% 50V
2037	4822 126 13061	220nF 20% 25V
2041▲	5322 126 10223	4.7nF 10% 63V
2043▲	5322 126 10223	4.7nF 10% 63V
2044▲	5322 126 10223	4.7nF 10% 63V

2045	4822 122 32139	12pF 2% 63V
2045	4822 126 13689	18pF 1% 63V
2050	4822 126 13296	100nF 10% 16V
2053	4822 126 13296	100nF 10% 16V
2080▲	5322 122 32654	22nF 10% 63V
2082	4822 124 40763	2.2µF 100 V
2084	4822 126 13296	100nF 10% 16V
2101▲	5322 126 10223	4.7nF 10% 63V
2104	4822 124 11529	16V 47U 20%
2109	4822 121 41738	270nF 5% 63V
2112	4822 122 33891	3.3nF 10% 63V
2113	4822 122 33891	3.3nF 10% 63V
2117▲	5322 126 10223	4.7nF 10% 63V
2120	4822 122 33175	2.2nF 20% 50V
2120	4822 122 33891	3.3nF 10% 63V
2122	4822 122 33175	2.2nF 20% 50V
2122	5322 122 31865	1.5nF 10% 63V
2123	4822 122 31644	2.2nF 10% 63V
2124▲	4822 124 41579	10µF 20% 50V
2125▲	5322 122 32654	22nF 10% 63V
2126	4822 124 40769	4.7µF 20% 100V
2127	4822 124 40763	2.2µF 100 V
2128	5322 122 32531	100pF 5% 50V
2129▲	4822 124 41579	10µF 20% 50V
2152	4822 124 40763	2.2µF 100 V
2153	5322 122 32531	100pF 5% 50V
2154	4822 122 33175	2.2nF 20% 50V
2155	5322 121 42661	330nF 5% 63V
2156	4822 126 13061	220nF 20% 25V
2158▲	5322 126 10223	4.7nF 10% 63V
2161	4822 124 40201	1000µF 20% 16V
2162	4822 122 33575	220pF 5% 50V
2163	4822 124 40756	1µF 20% 100V
2169	4822 122 33515	82pF 5% 63V
2170▲	4822 122 33177	10nF 20% 50V
2171▲	5322 126 10223	4.7nF 10% 63V
2180▲	4822 124 41579	10µF 20% 50V
2194	4822 122 33175	2.2nF 20% 50V
2196	4822 124 80927	3.3µF 20% 50V
2197▲	4822 126 12944	47nF 10% 50V
2198▲	4822 126 12944	47nF 10% 50V
2239	4822 126 13296	100nF 10% 16V
2248▲	4822 124 41579	10µF 20% 50V
2261	4822 122 33891	3.3nF 10% 63V
2262▲	4822 126 10002	100nF 20% 25V
2265	4822 126 13689	18pF 1% 63V
2267	4822 126 13296	100nF 10% 16V
2268	4822 121 42408	220nF 5% 63V
2271▲	5322 122 32654	22nF 10% 63V
2272▲	5322 122 34123	1nF 10% 50V
2273▲	5322 122 34123	1nF 10% 50V
2274	4822 126 13296	100nF 10% 16V
2275	4822 126 13296	100nF 10% 16V
2279	4822 126 13296	100nF 10% 16V
2280	4822 126 13296	100nF 10% 16V
2290	4822 126 13296	100nF 10% 16V
2291▲	4822 122 33177	10nF 20% 50V
2292▲	4822 122 33177	10nF 20% 50V
2293▲	4822 122 33177	10nF 20% 50V
2295	4822 124 40756	1µF 20% 100V
2297	4822 124 41751	47µF 20% 50V
2298	5322 122 32452	47pF 5% 63V
2340	5322 121 42366	100nF 5% 63V
2345	4822 126 13473	220nF 80-20% 50V
2350▲	5322 126 10223	4.7nF 10% 63V
2351	4822 124 40756	1µF 20% 100V
2354	4822 126 13473	220nF 80-20% 50V
2366▲	4822 122 33177	10nF 20% 50V
2370	4822 124 40756	1µF 20% 100V
2371▲	5322 122 32654	22nF 10% 63V
2400	5322 122 32268	470pF 10% 50V
2401	4822 124 41334	470µF 20% 35V
2401	4822 124 80065	1000µF 20% 50V
2402	4822 124 40243	1.5µF 20% 63V
2402	4822 124 40756	1µF 20% 100V
2404▲	4822 126 12944	47nF 10% 50V
2405	4822 122 33175	2.2nF 20% 50V
2415	4822 121 41922	22nF 10% 250V
2415▲	4822 121 42004	10nF 10% 400V
2420	4822 121 10513	7.5nF 1KV 5%
2420	4822 121 10514	1KV 10N 5%
2421	4822 121 51319	1µF 10% 63V
2422▲	4822 121 42365	330nF 5% 250V
2422▲	4822 121 42376	470nF 5% 250V
2423▲	4822 126 12269	680pF 10% (HR) 2KV
2424	4822 124 42105	1000µF 20% 50V
2424	4822 124 80064	680µF 20% 50V
2425	4822 124 80064	680µF 20% 50V
2426	4822 124 80676	4.7µF 20% 160V
2427	5322 121 42489	33nF 5% 250V
2428	4822 121 51319	1µF 10% 63V
2429	5322 121 42661	330nF 5% 63V
2430	4822 121 42047	180nF 10% 250V

2431▲	5322 126 10223	4.7nF 10% 63V
2432▲	4822 122 33893	18nF 10% 63V
2500	4822 126 13597	330pF 10% 500V
2501▲	4822 126 11524	1.5nF 10% 1KV
2502	4822 121 43856	4.7nF 5% 250V
2503	5322 121 42489	33nF 5% 250V
2505▲	4822 126 14037	2.2nF 20% 250V
2506	4822 121 43343	4.7nF 10% 400V
2507▲	4822 121 10512	275V 220N 20%
2508▲	4822 126 11141	2.2nF 10% 1KV
2509▲	4822 126 11141	2.2nF 10% 1KV
2510▲	4822 121 42004	10nF 10% 400V
2511	4822 124 41596	22µF 20% 50V
2512	4822 124 40201	1000µF 20% 16V
2513	4822 126 13694	68pF 1% 63V
2514	4822 124 40201	1000µF 20% 16V
2515	4822 124 81257	47µF 50/10% 200V
2516	4822 124 11532	47µF 400V 20%
2516	4822 124 11831	68µF 20% 400V
2517▲	5322 122 34123	1nF 10% 50V
2518	5322 122 32452	47pF 5% 63V
2519▲	4822 126 11141	2.2nF 10% 1KV
2520▲	4822 126 11141	2.2nF 10% 1KV
2521▲	4822 124 12126	10µF 20% 400V
2522	4822 126 13599	3.3nF 10% 500V
2525	5322 121 42386	100nF 5% 63V
2526	4822 124 40201	1000µF 20% 16V
2526▲	4822 124 40433	47µF 20% 25V
2527	4822 126 13597	330pF 10% 500V
2528	4822 121 42408	220nF 5% 63V
2529	4822 124 40756	1µF 20% 100V
2531	5322 121 42498	680nF 5% 63V
2532	4822 124 40201	1000µF 20% 16V
2533	4822 124 40201	1000µF 20% 16V
2534	4822 124 81029	100µF 20% 25V
2535	5322 121 42386	100nF 5% 63V
2536	5322 121 42498	680nF 5% 63V
2537	4822 124 41596	22µF 20% 50V
2538	5322 121 42489	33nF 5% 250V
2539▲	4822 124 40433	47µF 20% 25V
2540	4822 121 42408	220nF 5% 63V
2602▲	4822 124 41579	10µF 20% 50V
2604▲	4822 124 41579	10µF 20% 50V
2615	5322 122 32531	100pF 5% 50V
2623	4822 124 40756	1µF 20% 100V
2624	4822 124 40769	4.7µF 20% 100V
2625	4822 122 32535	680pF 10% 63V
2629	4822 124 40763	2.2µF 100 V
2630	4822 124 40763	2.2µF 100 V
2651	4822 122 32535	680pF 10% 63V
2658	4822 126 13694	68pF 1% 63V
2662	4822 122 33175	2.2nF 10% 63V
2663▲	5322 126 10223	4.7nF 10% 50V
2666	4822 124 40255	100µF 20% 63V
2667	5322 122 32531	100pF 5% 50V
2668	4822 124 40255	100µF 20% 63V
2669	5322 122 32448	10pF 5% 50V
2676	5322 122 32452	47pF 5% 63V
2677	5322 122 32448	10pF 5% 50V
2678	5322 122 32448	10pF 5% 50V
2680	5322 122 32658	22pF 5% 50V
2681	5322 122 32658	22pF 5% 50V
2682	4822 126 13061	220nF 20% 25V
2682	5322 122 32531	100pF 5% 50V
2685	4822 124 81029	100µF 20% 25V
2686	4822 126 13482	470nF 80/20% 16V
2689	4822 122 32535	680pF 10% 63V
2701	5322 122 33244	8.2pF 5% 50V
2702	4822 122 32504	15pF 2% 63V
2703	5322 126 10511	1nF 5% 50V
2704▲	4822 126 10002	100nF 20% 25V
2705▲	4822 126 10002	100nF 20% 25V
2706▲	4822 124 41579	10µF 20% 50V
2707	4822 126 13296	10

## Spare parts list / Stükliste / Liste des pièces

3353	4822 051 20474	470k 5% 0.1W	3615	4822 117 10834	47k 1% 0.1W	3752	4822 051 20101	100Ω 5% 0.1W	6500	4822 130 34233	BZX79-B5V1
3354	4822 100 11483	10k 30% 0.1W	3617	4822 051 20472	4k7 5% 0.1W	3762	4822 051 20101	100Ω 5% 0.1W	6501	4822 130 34173	BZX79-B5V6
3368	4822 116 83884	47k 5% 0.5W	3618	4822 051 10332	3k3 2% 0.25W	3763	4822 051 20101	100Ω 5% 0.1W	6502	4822 130 34281	BZX79-B15
3369	4822 051 20224	220k 5% 0.1W				3764	4822 051 20101	100Ω 5% 0.1W	6503	4822 130 42488	BYD33D
3370	4822 051 20684	680k 5% 0.1W	3619	4822 050 11002	1k 1% 0.4W	3765	4822 051 20101	100Ω 5% 0.1W	6504	4822 130 41487	BYV95C
3400	4822 051 20333	33k 5% 0.1W	3620	4822 116 83864	10k 5% 0.5W	3768	4822 116 52175	100Ω 5% 0.5W	6506	4822 130 70021	S1NB60
3401	4822 051 20154	150k 5% 0.1W	3621	4822 051 20223	22k 5% 0.1W	3769	4822 051 20472	4k7 5% 0.1W			
3402	4822 051 20681	680Ω 5% 0.1W	3623	4822 117 10833	10k 1% 0.1W	3770	4822 051 20472	4k7 5% 0.1W	6507	5322 130 31938	BYV27-200
			3624	4822 051 20104	100k 5% 0.1W	3781	4822 051 10153	15k 2% 0.25W	6508	4822 209 81397	TL431CLPST
3403	4822 052 10689	68Ω 5% 0.33W	3625	4822 051 20333	33k 5% 0.1W				6509	4822 130 80883	BZV55-C4V7
3404	4822 052 10158	125 5% 0.33W	3628	4822 051 20333	33k 5% 0.1W	3786	4822 051 10102	1k 2% 0.25W	6510	4822 130 34197	BZX79-B12
3405	4822 052 11228	202 5% 0.5W	3630	4822 117 12345	360k 1% 0.1W	3788	4822 053 10279	27Ω 5% 1W	6511	4822 130 34197	BZX79-B12
3405	4822 052 11478	4k7 5% 0.5W	3631	4822 050 21504	150k 1% 0.6W	3788	4822 116 52175	100Ω 5% 0.5W	6514	5322 130 83584	BZT03-C130
3406	4822 053 10182	1k8 5% 1W				3850	4822 051 20562	5k6 5% 0.1W	6515	5322 209 12018	DF08M
3407	4822 101 11376	220Ω pot.meter				3851	4822 116 83953	75Ω 5% 0.125W	6516	4822 130 32896	BYD33M
3409	4822 051 10102	1k 2% 0.25W				3852	4822 051 20562	5k6 5% 0.1W	6517	5322 130 31932	BZT03-C200
3410	4822 051 20393	39k 5% 0.1W	3632	4822 051 10102	1k 2% 0.25W	3853	4822 116 83953	75Ω 5% 0.125W	6518	4822 130 42488	BYD33D
3412	4822 117 11449	2k2 1% 0.1W	3648	4822 116 52195	47Ω 5% 0.5W	3855	4822 116 83953	75Ω 5% 0.125W			
			3649	4822 116 52195	47Ω 5% 0.5W	3860	4822 051 20471	470Ω 5% 0.1W	6519	5322 130 31938	BYV27-200
3415	4822 053 12279	27Ω 5% 3W	3650	4822 050 11002	1k 1% 0.4W				6520	4822 130 32715	SB340
3415	4822 053 12399	39Ω 5% 3W	3651	4822 117 10833	10k 1% 0.1W	3862	4822 051 20471	470Ω 5% 0.1W	6521	4822 130 42488	BYD33D
3417	4822 116 52272	330k 5% 0.5W	3652	4822 051 20472	4k7 5% 0.1W	3863	4822 051 20223	22k 5% 0.1W	6522	4822 130 30621	1N4148
3419	4822 116 52303	8k2 5% 0.5W	3653	4822 051 20472	4k7 5% 0.1W	3864	4822 116 52289	5k6 5% 0.5W	6523	4822 130 30621	1N4148
3420	4822 116 83882	39k 5% 0.5W	3654	4822 117 11449	2k2 1% 0.1W	3865	4822 116 83953	75Ω 5% 0.125W	6524	4822 130 30621	1N4148
3420	4822 116 83884	47k 5% 0.5W	3655	4822 117 11384	2k7 1% 0.1W	3871	4822 117 11503	220Ω 1% 0.1W	6540	4822 130 34197	BZX79-B12
3421	4822 116 52244	15k 5% 0.5W	3656	4822 116 52283	4k7 5% 0.5W	3875	4822 116 83953	75Ω 5% 0.125W	6802	4822 130 82037	HZT33
3422	4822 117 11384	2k7 1% 0.1W				3876	4822 051 10332	3k3 2% 0.25W	6650	4822 130 34233	BZT03-B5V1
3423	4822 051 20561	560Ω 5% 0.1W	3658	4822 117 11384	2k7 1% 0.1W	3878	4822 117 10965	18k 1% 0.1W	6651	4822 130 80905	BZV55-F5V1
3424	4822 052 10109	10Ω 5% 0.33W	3659	4822 051 20182	1k8 5% 0.1W	3879	4822 051 10473	47k 2% 0.25W			
			3660	4822 116 52175	100Ω 5% 0.5W	3880	4822 051 20562	5k6 5% 0.1W	6658	4822 130 30621	1N4148
3425	4822 053 11129	10Ω 5% 2W	3661	4822 050 11002	1k 1% 0.4W				6663	4822 209 72895	TLUV5320
3426	4822 116 52289	5k6 5% 0.5W	3662	4822 051 20333	33k 5% 0.1W	3881	4822 117 10833	10k 1% 0.1W	6704	4822 130 82886	BZV55-B3V0
3427	4822 052 11108	1Ω 5% 0.5W	3663	4822 117 10353	150Ω 1% 0.1W	3887	4822 051 20471	470Ω 5% 0.1W	6705	4822 130 80446	BAS32L
3428	4822 052 11108	1Ω 5% 0.5W	3664	4822 051 20683	68k 5% 0.1W	3888	4822 117 11139	1k5 1% 0.1W	6751	4822 130 81227	BZV55-F5V6
3430	4822 052 10821	820Ω 5% 0.33W	3665	4822 051 20683	68k 5% 0.1W	3889	4822 051 10751	750Ω 2% 0.25W	6849	4822 130 30621	1N4148
3431	4822 052 11471	470Ω 5% 0.5W	3666	4822 116 83868	150Ω 5% 0.5W	3890	4822 117 11507	6k8 1% 0.1W	6850	4822 130 80446	BAS32L
3432	4822 051 20105	1M 5% 0.1W				3891	4822 117 10833	10k 1% 0.1W	6851	4822 130 80446	BAS32L
3432	4822 051 20225	2M2 5% 0.1W	3667	4822 116 83864	10k 5% 0.5W	3892	4822 116 52269	3k3 5% 0.5W	6852	4822 130 80446	BAS32L
3433	4822 051 20393	39k 5% 0.1W	3668	4822 051 20433	43k 5% 0.1W	3895	4822 116 83953	75Ω 5% 0.125W	6853	4822 130 80446	BAS32L
3434	4822 051 20223	22k 5% 0.1W	3669	4822 117 10833	10k 1% 0.1W	4xxx	4822 051 10008	0Ω 5% 0.25W			
			3670	4822 116 83864	10k 5% 0.5W				6854	4822 130 80446	BAS32L
3436	4822 052 10151	150Ω 5% 0.33W	3671	4822 051 10103	10k 2% 0.25W				6855	4822 130 80446	BAS32L
3437	4822 053 11103	10k 5% 2W	3672	4822 117 11449	2k2 1% 0.1W				6865	4822 130 80446	BAS32L
3440	4822 116 83868	150Ω 5% 0.5W	3673	4822 117 10833	10k 1% 0.1W						
3500	4822 051 20331	330Ω 5% 0.1W	3674	4822 117 11449	2k2 1% 0.1W	5010	4822 157 63081	0.56μH 20%			
3500	4822 117 11504	270Ω 1% 0.1W	3676	4822 116 83864	10k 5% 0.5W	5010	4822 157 63858	0.39μH			
3501	4822 051 20101	100Ω 5% 0.1W	3677	4822 117 11384	2k7 1% 0.1W	5012	4822 157 53539	0.27μH 5%			
3502	4822 116 83864	10k 5% 0.5W				5032	4822 157 53634	5.6μH 10%	7001	4822 209 80817	L7805CV
3503	4822 116 83864	10k 5% 0.5W	3678	4822 117 11149	82k 1% 0.1W	5040	4822 157 71512	38mH	7015	4822 209 15106	TD8361E/N5
3504	4822 116 52219	330Ω 5% 0.5W	3679	4822 117 11449	2k2 1% 0.1W	5042	4822 157 71518	33mH	7015	4822 209 15251	TD8362E/N5
3505	4822 116 52213	180Ω 5% 0.5W	3680	4822 051 20101	100Ω 5% 0.1W	5043	4822 157 71517	38mH	7030	5322 130 41982	BC848B
			3681	4822 051 20472	4k7 5% 0.1W	5043	4822 157 71517	38mH	7103	5322 130 42755	BC847C
3506	4822 117 12094	0.33Ω 5%	3682	4822 051 20101	100Ω 5% 0.1W	5195	4822 157 11213	22μH	7125	4822 209 63105	TD8364/V3
3507	4822 050 21202	1k2 1% 0.6W	3683	4822 051 20101	100Ω 5% 0.1W	5196	4822 157 11213	22μH	7126	5322 130 41982	BC848B
3507	4822 050 21502	1k5 1% 0.6W	3684	4822 051 20332	3k3 5% 0.1W				7127	5322 130 41982	BC848B
3508	4822 053 10682	6k8 5% 1W	3685	4822 051 20332	3k3 5% 0.1W	5415	4822 157 10359	33μH	7140	5322 209 10576	HEF4053BD
3509	4822 116 52271	33k 5% 0.5W	3691	4822 116 52234	100k 5% 0.5W	5415	4822 157 71519	47μH 5%			
3510	4822 117 12096	22k 1%	3694	4822 051 20472	4k7 5% 0.1W	5421	4822 157 11421	100μH 10%	7141	5322 130 41982	BC848B
3511	4822 053 10272	2k7 5% 1W				5422	4822 140 10639	LOT (Line output transformer)	7142	5322 130 41982	BC848B
3512	4822 116 52297	68k 5% 0.5W	3695	4822 051 20472	4k7 5% 0.1W				7143	5322 130 41982	BC848B
3513	4822 053 10334	330k 5% 1W	3696	4822 051 20472	4k7 5% 0.1W	5424	4822 156 50097	Linearity coil	7150	5322 130 41982	BC848B
3514	4822 052 10108	1Ω 5% 0.33W	3697	4822 051 20472	4k7 5% 0.1W	5500	4822 146 10461	Power trafo	7155	5322 130 41982	BC848B
			3698	4822 051 20333	33k 5% 0.1W	5502	4822 146 10748	Power trafo	7156	5322 130 41982	BC848B
3515	4822 052 10108	1Ω 5% 0.33W	3699	4822 051 20332	3k3 5% 0.1W	5503	4822 526 10494	Ferrite bead	7157	4822 209 32531	TD87056A/N2
3516	4822 116 40137	PTC 36Ω 365V	3702	4822 051 20332	3k3 5% 0.1W	5504	4822 157 53348	Choke	7170	5322 130 41982	BC848B
3517	4822 117 11504	270Ω 1% 0.1W	3704	4822 051 20562	5k6 5% 0.1W	5505	4822 157 70826	2.4μH	7243	5322 130 41982	BC848B
3518	4822 117 12952	120k 5% 1W	3705	4822 051 20273	27k 5% 0.1W						
3519	4822 051 20105	1M 5% 0.1W	3706	4822 051 20331	330Ω 5% 0.1W	5506	4822 157 50964	100μH	7250	4822 209 90129	TD8395/N2
3521	4822 117 11504	270Ω 1% 0.1W	3707	4822 117 11449	2k2 1% 0.1W	5509	4822 157 71915	5.6μH	7271	4822 209 12635	TD84665/V4
3523	4822 052 10108	1Ω 5% 0.33W	3709	4822 051 20333	33k 5% 0.1W	5601	4822 157 51462	10μH	7400	4822 130 40981	BC337-25
3524	4822 052 11108	1Ω 5% 0.5W				5671	4822 157 71703	82μH	7401	4822 130 40917	BD238
3525	4822 053 11278	2k7 5% 2W	3713	4822 051 20223	22k 5% 0.1W	5677	4822 152 20678	33μH	7402	4822 130 40923	BD139
			3714	4822 117 10833	10k 1% 0.1W	5701	4822 157 60141	3.3μH	7402	4822 130 44235	BD237
3526	4822 116 83883	470Ω 5% 0.5W	3716	4822 117 10353	150Ω 1% 0.1W	5704	4822 157 60123	6.8μH	7420	4822 130 10025	CNX82A
3527	4822 116 52271	33k 5% 0.5W	3718	4822 117 10353	150Ω 1% 0.1W				7421	5322 130 44647	BC368
3528	4822 050 24702	4k7 5% 0.6W	3719	4822 117 11454	820Ω 1% 0.1W				7422	4822 130 10206	BUT11AX
3529	4822 116 83872	220Ω 5% 0.5W	3720	4822 050 11002	1k 1% 0.4W				7423	5322 13	

7658▲ 4822 209 73852 PMBT2369  
7665▲ 5322 130 41982 BC848B  
7670▲ 5322 130 41982 BC848B  
7672▲ 5322 130 41982 BC848B  
7674▲ 5322 130 41982 BC848B  
7685 4822 209 32709 ST24C04FB1  
7700 4822 209 90125 SAA5254/P/E/MIC  
7702 5322 209 10357 HEF4066BP

7711▲ 5322 130 41982 BC848B  
7713▲ 5322 130 41982 BC848B  
7715▲ 5322 130 41982 BC848B  
7731 5322 130 41983 BC858B  
7732▲ 5322 130 41982 BC848B  
7740▲ 5322 130 41982 BC848B  
7745▲ 5322 130 41982 BC848B  
7751▲ 4822 130 41344 BC337-40  
7856▲ 5322 130 41982 BC848B  
7857 5322 130 41983 BC858B

7858▲ 5322 130 41982 BC848B  
7875▲ 5322 130 41982 BC848B  
7876▲ 5322 130 41982 BC848B

### Smart Loader [A6A]

#### Various

4822 212 10424 Smart Loader  
Panel  
4822 265 10457 Con. 8P F-pin  
(LM1)



3930 4822 116 83883 470Ω 5% 0.5W  
3931▲ 4822 052 10279 27Ω 5% 0.33W  
3932▲ 4822 052 10279 27Ω 5% 0.33W  
3933▲ 4822 052 10279 27Ω 5% 0.33W



7930 5322 209 10576 HEF4053BD

### CRT Panel [B1]

#### Various

4822 212 11573 CRT panel (14")  
4822 212 11574 CRT panel (21")  
▲ 4822 255 70261 CRT socket (21")  
▲ 4822 255 70306 CRT socket (14"),  
8P m-neck  
1371▲ 4822 252 51175 Fuse 2.5A



2301 4822 124 80791 470μF 20% 16V  
2304 5322 122 31863 330pF 5% 50V  
2304 5322 126 10733 680pF 5% 50V  
2324 4822 122 33216 270pF 5% 50V  
2324 5322 116 80853 560pF 5% 63V  
2344 5322 122 31863 330pF 5% 50V  
2344 5322 126 10733 680pF 5% 50V  
2373 4822 121 41926 33nF 5% 630V  
2374 4822 124 81107 4.7μF 20% 250V



3300 4822 100 12226 2k2 30% LIN0.1W  
3301 4822 116 83872 220Ω 5% 0.5W  
3303 4822 116 52219 330Ω 5% 0.5W  
3304 4822 116 52197 56Ω 5% 0.5W  
3310 4822 100 12227 4k7 30% LIN0.1W  
3311 4822 116 52207 1k2 5% 0.5W  
3312 4822 116 52175 100Ω 5% 0.5W  
3313 4822 116 83868 150Ω 5% 0.5W  
3314▲ 4822 053 11123 12k 5% 2W

3315 4822 050 21502 1k5 1% 0.6W  
3316 4822 051 20562 5k6 5% 0.1W  
3320 4822 100 12226 2k2 30% LIN0.1W  
3321 4822 116 52222 390Ω 5% 0.5W  
3322 4822 116 52243 1k5 5% 0.5W  
3323 4822 051 20331 330Ω 5% 0.1W  
3324 4822 116 52197 56Ω 5% 0.5W  
3325 4822 051 20562 5k6 5% 0.1W  
3330 4822 100 12227 4k7 30% LIN0.1W  
3331 4822 116 52207 1k2 5% 0.5W

3333 4822 116 83868 150Ω 5% 0.5W  
3334▲ 4822 053 11123 12k 5% 2W  
3335 4822 050 21502 1k5 1% 0.6W

3336 4822 116 52175 100Ω 5% 0.5W  
3339▲ 4822 053 11123 12k 5% 2W  
3343 4822 051 20331 330Ω 5% 0.1W  
3344 4822 116 52197 56Ω 5% 0.5W  
3346 4822 100 12227 4k7 30% lin.1W  
3347 4822 116 52207 1k2 5% 0.5W  
3348 4822 116 83868 150Ω 5% 0.5W

3352 4822 116 52175 100Ω 5% 0.5W  
3355 4822 050 21502 1k5 1% 0.6W  
3357 4822 051 20562 5k6 5% 0.1W  
3360 4822 117 11504 270Ω 1% 0.1W  
3361▲ 4822 051 20332 3k3 5% 0.1W  
3362 4822 051 20681 680Ω 5% 0.1W  
3363▲ 4822 052 10109 10Ω 5% 0.33W  
3371▲ 4822 052 10228 2Ω 5% 0.33W  
3372▲ 4822 052 10228 2Ω 5% 0.33W  
3373 4822 050 21502 1k5 1% 0.6W  
3374 4822 050 21502 1k5 1% 0.6W



6310 4822 130 34174 BZX79-B4V7  
6314▲ 4822 130 42489 BYD33G  
6330 4822 130 34174 BZX79-B4V7  
6334▲ 4822 130 42489 BYD33G  
6350 4822 130 34174 BZX79-B4V7  
6354▲ 4822 130 42489 BYD33G  
6355 4822 130 34382 BZX79-B8V2



7300 4822 130 40937 BC548B  
7310 4822 130 41782 BF422  
7320 4822 130 40937 BC548B  
7330 4822 130 41782 BF422  
7340 4822 130 40937 BC548B  
7350 4822 130 41782 BF422  
7360 5322 130 41983 BC858B

### Clock Panel [E1]

#### Various

4822 212 10525 Clock panel  
4822 267 41047 Con. 4P



2951▲ 4822 126 10002 100nF 20% 25V  
2952 4822 122 33498 2.7nF 10% 63V  
2953 4822 124 81029 100μF 20% 25V



3951▲ 4822 051 20101 100Ω 5% 0.1W  
3952▲ 4822 051 20101 100Ω 5% 0.1W  
3953 4822 051 10101 100Ω 2% 0.25W  
3954▲ 4822 051 20101 100Ω 5% 0.1W



6951 4822 130 80312 TLHY4400  
6952 4822 130 10212 TLHR4401



7951 4822 209 32304 SAA1064T  
7952 4822 130 42615 BC817-40  
7953 4822 130 42615 BC817-40  
7954 4822 130 42615 BC817-40  
7955 4822 130 42615 BC817-40  
7956 4822 130 10213 LTS4801G  
7957 4822 130 10213 LTS4801G  
7958 4822 130 10213 LTS4801G  
7959 4822 130 10213 LTS4801G

### Radio Panel [E2]

#### Various

4822 212 10426 Radio Panel  
4822 267 40722 Con. 6p (RP1)  
4822 264 40239 Con. 3P (RM1)  
1910 4822 210 10725 Radio tuner



2901▲ 4822 124 41579 10μF 20% 50V

2902▲ 4822 124 41579 10μF 20% 50V  
2903▲ 4822 124 41579 10μF 20% 50V  
2905▲ 4822 124 41579 10μF 20% 50V



3901 4822 050 11002 1k 1% 0.4W  
3902 4822 116 83884 47k 5% 0.5W  
3903 4822 116 52238 12k 5% 0.5W  
3904 4822 050 11002 1k 1% 0.4W  
3905 4822 050 11002 1k 1% 0.4W  
3906 4822 116 52269 3k3 5% 0.5W  
3907 4822 116 83884 47k 5% 0.5W  
3908 4822 116 52283 4k7 5% 0.5W



6901 4822 130 34167 BZX79-B6V2



7901 5322 209 10576 HEF4053BD  
7902 4822 130 40937 BC548B